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**Factors Affecting Citizens' Adoption of E-government  
Moderated by Socio-cultural Values in Saudi Arabia**

**By**

**Mohammed Alsaif**

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Institute of Local Government Studies  
School of Government and Society  
College of Social Sciences  
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## **Abstract**

Many governments around the world have accelerated their implementation of e-government, in order to enhance the efficiency, effectiveness, quality, speed and accessibility of their services. However, there is no universal model that may be applied to governments worldwide. Each government implements its own individual programme, whilst taking into account the characteristics of the country that involve social, cultural, economic and political factors. Characteristics such as these may assist or hinder the implementation and adoption of e-government. E-government adoption had been studied widely from the perspectives of technical and management factors. There is a need for further research to examine the human factors involved, and particularly the cultural, social and psychological elements of users in developing countries. This is seen by the researcher as particularly relevant when considering the different cultural and social issues related to citizens using e-public services in developing countries rather than developed countries. The literature review of technology adoption and culture values suggests that low levels of adoption of e-government in developing countries should not be blamed on the culture or individual citizens, but that new technology needs to be adapted to suit the culture of Arab societies to achieve high diffusion of technology.

This study aims to consider the problems associated with the low response of citizens to the adoption of e-government in developing Arab countries, with a predominant focus on the Kingdom of Saudi Arabia. It is necessary for this new innovation to be tailored to citizens' wishes, and taking into account the religious, cultural, traditional and other beliefs to ensure the widespread adoption of this innovation.

The study used an online quantitative questionnaire to survey citizens from heterogeneous groups within a diverse area of Saudi Arabia as a case study. The study has validated the Unified Theory of Acceptance and Use of Technology (UTAUT) in Saudi Arabia and has extended the theory by including further variables such as the trust, compatibility, awareness and the service quality which we proposed to influence citizens' adoption of e-government in Saudi Arabia. The findings reveal that performance expectancy is the strong predictor of the intention to use e-government followed by the trust of the internet. In addition, intention to use behaviour, computer self-efficacy and availability of resources found to be significant predictors of the usage behaviour.

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## **List of Abbreviations**

<b>B2B</b>	<b>Business to Business</b>
<b>B2C</b>	<b>Business to Consumer</b>
<b>C2C</b>	<b>Consumer to Consumer</b>
<b>CFA</b>	<b>Confirmatory Factor Analysis</b>
<b>CITC</b>	<b>Communication and Information Technology Commission</b>
<b>CRM</b>	<b>Customer Relation Management</b>
<b>DOI</b>	<b>Diffusion of Innovations Theory</b>
<b>EBPP</b>	<b>Electronic Bill Presentment and Payment</b>
<b>EDI</b>	<b>Electronic Data Interchange</b>
<b>EFA</b>	<b>Exploratory Factor Analysis</b>
<b>G2B</b>	<b>Government to Business</b>
<b>G2C</b>	<b>Government to Citizens</b>
<b>G2E</b>	<b>Government to Employee</b>
<b>G2G</b>	<b>Government to Government</b>
<b>G2N</b>	<b>Government to Non-profit sector</b>
<b>GDP</b>	<b>Gross Domestic Product</b>
<b>GLM</b>	<b>General Linear Module</b>
<b>GSN</b>	<b>Government Secure Network</b>
<b>ICT</b>	<b>Information and Communication Technology</b>
<b>IDV</b>	<b>Individualism</b>
<b>IT</b>	<b>Information Technology</b>
<b>ITU</b>	<b>International Telecommunication Union</b>
<b>IQ</b>	<b>Information Quality</b>
<b>IS</b>	<b>Information Systems</b>
<b>ISD</b>	<b>Information System Development</b>
<b>KSA</b>	<b>Kingdom of Saudi Arabia</b>
<b>MCIT</b>	<b>Ministry of Communication and Information Technology</b>
<b>MM</b>	<b>Motivational Model</b>
<b>MPCU</b>	<b>Model of PC Utilisation</b>
<b>PDI</b>	<b>Power Distance Index</b>

<b>PEOU</b>	<b>Perceived Ease of Use</b>
<b>PKI</b>	<b>Public Key Infrastructure</b>
<b>PU</b>	<b>Perceived Usefulness</b>
<b>RDD</b>	<b>Random Digital Dialling</b>
<b>SAMA</b>	<b>Saudi Arabian Monetary Authority</b>
<b>SCT</b>	<b>Social Cognitive Theory</b>
<b>SLRs</b>	<b>Strategic Literature Reviews</b>
<b>STC</b>	<b>Saudi Telecommunication Company</b>
<b>STS</b>	<b>Socio-Technical System</b>
<b>TAM</b>	<b>Technology Acceptance Model</b>
<b>TOI</b>	<b>Trust of the Internet</b>
<b>TOG</b>	<b>Trust of the Government</b>
<b>TPB</b>	<b>Theory of Planned Behavior</b>
<b>TRA</b>	<b>Theory of Reasoned Action</b>
<b>UAE</b>	<b>United Arab Emirate</b>
<b>UAI</b>	<b>Uncertainty Avoidance Index</b>
<b>UN</b>	<b>United Nations</b>
<b>UTAUT</b>	<b>Unified Theory of Acceptance and Use of Technology.</b>

## Table of Contents

Abstract.....	I
Acknowledgements .....	II
Declaration.....	III
List of Abbreviations .....	IV
List of Figures.....	XII
List of Tables.....	XIII
<b>Chapter 1: Introduction</b>	
The Context of the Research .....	1
Problem statement .....	10
Objectives of the Research .....	12
Research Questions .....	12
Research Significance.....	13
Thesis Structure .....	14
Chapter 2: Research Framework .....	15
Chapter 3: The Kingdom of Saudi Arabia: Background .....	15
Chapter 4: Theoretical Research .....	16
Chapter 5: Research Design .....	17
Chapter 6: Data Presentation and Analysis .....	18
Chapter 7: Discussion.....	18
Chapter 8: Conclusion .....	18
<b>Chapter 2: Research Framework</b>	
Introduction .....	19
E-government background .....	19
E-government and E-commerce .....	21
E-government Definition.....	24
E-government cataloguing.....	27
E-government Sectors .....	28
Government to Citizens (G2C).....	28
Government to Business (G2B) .....	29
Government to Government (G2G) .....	29
Government to Employee (G2E).....	29



E-Government Stages.....	30
Presence Stage.....	31
Interaction Stage.....	31
Transaction Stage .....	32
Transformation Stage .....	32
E-government opportunity.....	36
E-government constraints .....	40
Success factors for e-government implementation.....	44
E-Government Implementation and Adoption .....	48
Conclusion.....	52
<b>Chapter 3: The Kingdom of Saudi Arabia: Background</b>	
Introduction .....	54
Saudi Arabia: Characteristics .....	55
Saudi Arabia: Location.....	55
Saudi Arabia: Demographic information .....	56
Saudi Arabia: Climate .....	57
Saudi Arabia: Economy.....	57
Saudi Arabia: Culture .....	58
The Kingdom of Saudi Arabia: The ICT Sector .....	61
National Information Technology Plan.....	62
Saudi Arabia: ICT Indicators .....	62
Saudi Arabia: e-commerce .....	64
E-government project in Saudi Arabia .....	66
Yesser program.....	66
E-government projects: national initiatives.....	71
Saudi E-government Portal "Saudi" .....	72
SADAD E-Payment System.....	72
Smart Card Project .....	73
E-Umrah project .....	73
Electronic Data Interchange Project (SaudiEDI) .....	73
Al Madinah Almunawwarah E-Government Portal.....	74
Human Resource initiative .....	74
Initiatives for infrastructure improvement .....	75

Saudi Arabia: M-government .....	76
UN Assessment of e-government Development .....	77
Saudi Arabia: Research into Technology Adoption .....	78
Conclusion .....	81
<b>Chapter 4: Theoretical Research</b>	
Introduction .....	82
Adoption's Theories and Models .....	82
Theory of Reasoned Action (TRA) .....	83
Theory of planned behaviour (TPB) .....	84
Motivational Model (MM) .....	85
Model of PC Utilisation (MPCU) .....	85
Social Cognitive Theory (SCT).....	86
Diffusion Of Innovation Theory (DOI).....	87
Technology Acceptance Model (TAM) .....	88
Unified theory of acceptance and use of technology (UTAUT) .....	89
E-government adoption: Model of trust and risk .....	91
Research into Citizens' Adoption of E-government.....	92
E-government adoption: socio-cultural characteristics .....	102
Research Based Theory .....	108
Research Hypothesis Development .....	112
Awareness of the system .....	112
Compatibility.....	112
Social influence .....	113
Performance expectancy.....	114
Effort expectancy .....	115
Trust.....	116
Behavioural intention .....	117
Computer self-efficacy and resource availability.....	117
Quality of Information.....	119
System quality .....	120
Proposed Research Model .....	120
Conclusion.....	121

## **Chapter 5: Research Design**

Introduction .....	123
Systematic review of the literature .....	123
Theory and research.....	126
The Purpose of the Research .....	127
Research philosophy.....	129
Epistemological Considerations .....	129
Positivism .....	130
Interpretivism .....	131
Ontological Considerations .....	131
Objectivism .....	131
Constructionism.....	131
Axiological considerations .....	132
Rhetorical considerations .....	132
Methodological considerations.....	132
Methodology of the Research.....	135
Research Strategy .....	138
Research Sample.....	141
Types of sampling .....	141
Errors in sampling .....	142
Online survey sampling methods .....	143
Probability sampling methods for online surveys .....	143
Non-probability sampling for online methods .....	144
Determining the sample for this thesis .....	145
Sample: Defining the population.....	145
Sample: Shaping the sampling frame .....	146
Sample: Determining the sampling technique.....	146
Collecting data.....	147
Survey methods .....	147
The Design of the Questionnaire .....	148
Translation .....	154
Pilot study .....	154
Reliability and validity .....	155

Ethical Considerations .....	156
Conclusion .....	157
<b>Chapter 6: Data Presentation and Analysis</b>	
Introduction .....	158
Data Analysis: preliminary stages .....	159
Cleaning and Screening Data .....	159
Missing data and accuracy .....	159
Outliers .....	160
Data Normality .....	161
Descriptive Statistics .....	162
Demographic profile.....	162
Patterns of Internet Usage .....	164
E-government adoption behaviour .....	165
Usage Behaviour: Factors .....	169
Intention Behaviour: Factors .....	170
Awareness Behaviour: Factors .....	171
Reliability test.....	172
Validity test .....	174
Content validity .....	174
Construct validity .....	175
Inferential analysis.....	175
Factor analysis.....	175
Preliminary analysis .....	176
Factor Extraction .....	177
Factor Rotation .....	179
Regression analysis .....	182
Moderated Demographic variables .....	187
Conclusion.....	190
<b>Chapter 7: Discussion</b>	
Introduction .....	192
Discussion of the Findings .....	192
A Discussion of the Hypotheses.....	197
Intention to use e-government behaviour .....	197

Awareness of the system .....	197
System Compatibility .....	199
Social influence .....	200
Performance expectancy.....	202
Effort expectancy .....	203
Internet Trust .....	205
Government Trust.....	206
E-government behaviour and usage .....	206
Behavioural intention .....	206
Computer self efficacy .....	207
Resources availability.....	208
Service Quality .....	208
Research Adoption Model.....	211
Conclusion.....	213
<b>Chapter 8: Conclusion</b>	
Introduction .....	215
An Overview of the Research.....	215
Research Findings .....	220
Contribution of the Research.....	223
Practice Implications .....	225
Research Implications.....	228
Limitations of Research.....	229
Future Research .....	230
Conclusion.....	232
References .....	233
Appendix .....	271
Questionnaire Survey .....	271

## List of Figures

<b>Figure 2.1:</b> E-government components.....	30
<b>Figure 2.2:</b> Stage of e-government by Gartner Group.....	31
<b>Figure 2.3:</b> Stages of e-government by Layne and Lee.....	33
<b>Figure 2.4:</b> Success factors for implementing e-government.....	44
<b>Figure 2.5:</b> E-government Implementation Themes.....	51
<b>Figure 2.6:</b> Model of national culture impact on the government readiness.....	51
<b>Figure 3.1:</b> Map of Saudi Arabia.....	56
<b>Figure 3.2:</b> Development plan for ICT in Saudi Arabia.....	62
<b>Figure 3.3:</b> The growth of the Internet market in Saudi Arabia.....	63
<b>Figure 3.4:</b> Main objectives of Yesser.....	67
<b>Figure 3.5:</b> Components of e-government.....	68
<b>Figure 3.6:</b> Saudi Arabia: e-government stages.....	69
<b>Figure 3.7:</b> E-government implementation: challenges.....	69
<b>Figure 3.8:</b> Yesser Second action plan: components.....	70
<b>Figure 3.9:</b> E-government values for KSA.....	71
<b>Figure 4.1:</b> Theory of reasoned action.....	84
<b>Figure 4.2:</b> Theory of planned behaviour.....	85
<b>Figure 4.3:</b> Social cognitive theory.....	86
<b>Figure 4.4:</b> Diffusion of innovation theory.....	87
<b>Figure 4.5:</b> Technology acceptance model.....	89
<b>Figure 4.6:</b> Unified theory of acceptance and use of technology.....	90
<b>Figure 4.7:</b> E-government adoption; Trust and Risk.....	91
<b>Figure 4.8:</b> IT Transfer and cultural influence modelling.....	105
<b>Figure 4.9:</b> Proposed model of the adoption of e-government in Saudi Arabia.....	121
<b>Figure 6.1:</b> Eigen value for intention to use components.....	178
<b>Figure 6.2:</b> Eigen values for using behaviour components.....	179
<b>Figure 7.1:</b> Research Adoption Model.....	213

## List of Tables

<b>Table 2.1:</b> Significant Challenges of E-Government.....	43
<b>Table 3.1:</b> ICT Statistics in Saudi Arabia.....	63
<b>Table 3.2:</b> Ranking of e-government development in Saudi Arabia.....	78
<b>Table 3.3:</b> Saudi Arabia: Technology Adoption Key Research.....	80
<b>Table 4.1:</b> Theoretical researches relating to the adoption of e-government by citizens..	101
<b>Table 4.2:</b> Arab world cultural dimensions.....	104
<b>Table 5.1:</b> Philosophy Assumptions. ....	133
<b>Table 5.2:</b> Methodology Assumptions.....	134
<b>Table 5.3:</b> A summary of the strengths and weaknesses of quantitative research.....	137
<b>Table 5.4:</b> Survey's constructs and items.....	153
<b>Table 6.1:</b> Respondents' Gender.....	163
<b>Table 6.2:</b> Respondents' Ages.....	163
<b>Table 6.3:</b> Respondents' levels of education.....	163
<b>Table 6.4:</b> Internet usages.....	164
<b>Table 6.5:</b> Respondents' internet.....	165
<b>Table 6.6:</b> Previously heard about e-government .....	165
<b>Table 6.7:</b> Paired sample T-test Comparison of methods to learn about e-government...	166
<b>Table 6.8:</b> Friedman Test Comparison of methods to learn about e-government.....	167
<b>Table 6.9:</b> Adoption behaviour: descriptive statistics.....	168
<b>Table 6.10:</b> E-government usages.....	169
<b>Table 6.11:</b> Factors affecting usage behaviour.....	170
<b>Table 6.12:</b> Factor affecting intension to use behaviour.....	171
<b>Table 6.13:</b> Factors affecting awareness behaviour.....	172
<b>Table 6.14:</b> Reliability statistics for the model.....	173
<b>Table 6.15:</b> Cronbach's Alpha for the model constructs.....	174
<b>Table 6.16:</b> KMO and Bartlett's Test.....	177
<b>Table 6.17:</b> Total variance explained for intension to use components.....	178
<b>Table 6.18:</b> Total variance explained for using behaviour components.....	179
<b>Table 6.19:</b> Rotated (Intension to Use) components.....	180
<b>Table 6.20:</b> Rotated (Using behaviour) components.....	181
<b>Table 6.21:</b> Intention to use behaviour (Model summary).....	183

<b>Table 6.22:</b> Intention to use behaviour (ANOVA Test).....	183
<b>Table 6.23:</b> Regression analysis coefficients for intension to use behaviour.....	183
<b>Table 6.24:</b> Correlations for intension to use factors.....	185
<b>Table 6.25:</b> Usage behaviour (module summary).....	185
<b>Table 6.26:</b> Usage behaviour (ANOVA Test).....	186
<b>Table 6.27:</b> Regression analysis for usage behaviour.....	186
<b>Table 6.28:</b> Levene's test of equality performance expectancy factor.....	187
<b>Table 6.29:</b> Gender* performance expectancy effect.....	187
<b>Table 6.30:</b> Levene's test of equality (trust of the internet factor).....	188
<b>Table 6.31:</b> Internet experience * trust effect.....	188
<b>Table 6.32:</b> Levene's Test of Equality.....	188
<b>Table 6.33:</b> Independent factors* moderated variables.....	189
<b>Table 6.34:</b> Levene's test of equality for computer –self-efficacy factor.....	190
<b>Table 6.35:</b> Internet experience * computer self –efficacy effect.....	190
<b>Table 7.1:</b> Summary of hypotheses results.....	211



# Chapter 1: Introduction

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## **The Context of the Research**

The Internet and Information and Communication Technology (ICT) revolution has altered the methods of interaction between citizens and the public sector, as well in their life style and business dealings. The phenomenon of the Internet has forced governments to improve civic engagement, as well as transforming society into an e-society; e-government is changing the relationship between citizens and their government. E-government refers to the use of information technologies by governments and their agencies, which are able to change relationships with citizens, businesses, and all aspects of government (World Bank, 2011).

Currently, government agencies worldwide no longer see e-government as an option, but as a highly important extension to the services that are offered to citizens. The effectiveness and efficiency of services in the public sector are seen as being the result of the implementation of e-government. The quality of new services, as well as reduction in time and associated costs, reduction in corruption and intimidation, as well as making government processes more efficient are other associated benefits recognised by governments. E-government provides an efficient method for citizens to participate in and to be included in public policy, as well as a convenient method for conducting online government transactions (Gupta and Jana, 2003; Moon, 2002).

The likely beneficiaries of e-government services have been classified into various sectors, which are: government to government (G2G) categorisation, which includes internal transactions between government departments, government to business (G2B) which includes the interaction of the public sector with the private sector and government to citizens (G2C) which includes all electronic services provided by government departments for citizens. G2C is the focus of this case study, which is designed to consider the factors that influence the density of citizen's e-services adoption in developing countries, such as in Saudi Arabia. E-government adoption not only embraces the technical aspects of such services, but is also influenced by social, organisational, human and cultural issues that have an impact upon the rate of adoption (Holtham and Carter, 1992; Belanger, 2004).

The automation of traditional government transactions is not the only issue arising from systems of e-government, because there are number of problems associated with the adoption and implementation of such systems, which include political, cultural, social, technical, organisational and human resource issues (Ndou, 2004; Al-Shehry et al., 2006). In developing countries, 35% of the e-government projects had completely failed, half of the projects had partly failed and only 15% were regarded as successful, according to Heeks (2006).

Failure of e-government projects are due to a number of factors, which include social and cultural issues, problems with infrastructure, lack of trust and confidentiality, issues relating to accessibility and usefulness, as well as misunderstanding the needs of citizens (DESA, 2008). These findings are compatible with the literature relating to outcomes following e-government adoption, which highlights a number of obstacles, such as perceived usefulness, perceived ease of use and digital divides (Davis, 1995).

An architecture framework was suggested by Ebrahim and Irani (2005), which recognises the barriers that face the adoption of e-government, revealing poor infrastructure, issues with privacy and security, lack of IT skills, together with organisational factors that include resistance to change, lack of effective leadership, lack of clear vision and difficulties with the re-engineering process. The lack of coordination and cooperation between departments are technical and organisational factors that inhibit the adoption of e-government. By contrast, the United Nations emphasises issues that relate to citizens, and addresses some of the reasons behind low e-government adoption, which includes: accessibility, usefulness, lack of confidentiality, lack of trust, inadequate infrastructure, inadequate delivery of services, as well as social and cultural issues that are perceived as critical issues facing the process of adoption (UN, 2010). DeLone and McLean (2003) recognised the importance of system quality, information quality and service quality as significant factors of website effectiveness which influence the success of the information system.

Factors influencing the adoption and implementation of e-government in the State of Qatar were considered by Al-Shafi and Weerakkody (2010). The authors developed a model that contained political, organisational, technical and social influences, which are institutional theory based. Power distribution, which refers to the shifting of authority and loss of power to facilitate e-government systems, are considered within the organisational model.

It also considers strategies for information systems, prioritisation of deliverables, changes in organisational culture, training needs, as well as the future needs of the organisation.

The technical theme that influences e-government implementation considers issues of privacy and security, integration of systems, e-government portal and access and standardisation of technologies. The political theme considers top management support availability, funding issues, legal and professional leadership issues that are required to adjust to the new innovation. The social theme includes a Citizen-Centric- Focus, which recognises the needs of citizens, as well as adjusting services to their values. Other social factors are also considered, including system awareness and the digital divides relating to accessibility and the level of citizens' knowledge and skills of the system.

Al-Shafi, and Weerakkody (2010) claimed that among these themes to be considered during implementation, e-government adoption is highly likely to be determined from the perspectives of citizens, as well as their behaviour towards e-government adoption.

E-government implementation success is 20% technology based, with 80% concerned with people, and organisational processes (Shajari and Ismail, 2010). Heeks (2006) states that 80% of the world's population live in developing countries, yet these reflect only 20% of users of e-government services. E-government adoption is considered to be an essential part of e-government success in developing countries, in order to provide economic and social benefits for citizens.

A number of researchers examined the development of e-government supply, which includes political, technical and organisational factors, yet neglects the citizen's perspective that relates to demand. A number of studies consider cultural characteristics, but are mostly concerned about economic issues, such as income levels, human capital, openness to trade and adoption costs. The less encouraging side of the development of e-government development relates not only to process, cost and infrastructure, but also to the rate of adoption by citizens. It was stated by Chan et al. (2008) that even the most efficient infrastructure could not assume a high level of adoption and continued usage, and emphasised the need for governments to effectively promote e-services following implementation.

The rate of technology adoption varies considerably within a variety of economic conditions. "Adoption decisions are highly subjective to the attitudes of the people in an organisation/country and, they may consequently be influenced by the organization/country's social and cultural characteristics" (Erumban and Jong, 2006; p. 3).

Citizens live within a cultural environment that has specific beliefs, traditions and norms, such as dominant cultural values within society that have a considerable impact upon individual behaviour, attitudes and practice.

Principles from the Socio-technical theory, developed at the Tavistock Institute in London between 1950 and 1960 by Trist & Bamforth (1951), are used in this study. The contemporary Socio-Technical System (STS) theory considers that the ICT implementation process comprises of two main sub-systems, which are the social and technical systems. The social sub-system is concerned with attitudes, skills and values balanced together with social, cultural and psychological needs. The technical system relates to hardware and software, tasks, methods and processes. Sub-systems such as these are interrelated at a point called joint optimisation towards a common goal (Sitter et al., 1997). The approach considered within this design emphasises the development of innovative behaviour in society in order to achieve pervasive ICT adoption, rather than exploiting traditional methods of encouraging people to use the technology. In this approach, technology is not seen as an independent system, but considered as an integrated part of the human condition, such as norms, values and personal attitudes (Eijnatten and Zwaan, 1998).

Damodaran et al. (2005) considered that the reason for the failure of large-scale information technology projects relates to the focus upon only technical aspects, whilst ignoring factors related to the social environment and the necessity to design the social system in parallel. One example of this were the failures of large-scale information systems within the UK's public sector, such as the UK Passport Office system (NAO, 1999), the London Ambulance Service Despatch System (Finkelstein & Dowell, 1996), as well as current issues within the Child Support Agency (Damodaran, et al 2005). Wider aspects of Socio-Technical System (STS) theory are investigated through factors relating to e-government adoption from the citizen's perspective in this study.

However, Purao and Desouza (2011) investigated the failure of large-scale public sector projects by analysing historical cases with Sentiments and Confidence expressed by different stakeholders. The study found that early indications of the projects' progress that may contribute to preventing undesirable outcomes in the future. Change in stakeholders; roles, the formation of and changes in public sector networks and triangulation of information available to different stakeholders could provide early warning of projects' progress.

The term 'adoption' is a term used in a variety of ways throughout the literature. However, in this study, e-government adoption includes engagement, interaction and involvement between government departments and citizens, and not solely providing information through government websites. Warkentin et al. (2002) used the term as relating to the intention of citizens to engage in e-government in order to request services and receive information from government agencies. Gilbert and Balestrini (2004) described the willingness of citizens to use e-government services as a concept. However, Carter and Belanger (2005) referred to 'adoption' as the intention to use e-government services. Brown et al. (2008) suggested using the term 'satisfaction' to replace intention, and using the term user satisfaction within large scale and integrated system as a dependent variable that measured the adoption of technology. E-government is at an early stage, and users require more time for the evaluation of services.

According to Verdegem and Verleye (2009), individual belief, service awareness, intention to use, willingness to use and actual usage are all precursors to individual satisfaction. Marketing theory also suggests that the adoption of a new service or product commences with an awareness, leading to an attitude towards the product or service, which then leads to an intention to use on a trial basis, finally leading to regular usage, together with associated satisfaction and acceptance (Pavlou & Fygenson, 2006). This research encompasses a stage of continuous adoption, commencing with awareness and understanding of the system, belief in the advantages of the system, attitudes towards the system, intention to use, actual use, together with final consumer acceptance and satisfaction.

Previous studies into the adoption of e-government have used a variety of theories and individual factors revealing citizens' attitudes towards the adoption of e-government in different countries. Various factors that influence the adoption of e-government are commented upon in the literature, which are dependent upon the local context of a country, or the use of a single system, such as collecting taxes or other government electronic services.

Based on Rogers' (1995) Diffusion of Innovations Theory (DOI); Carter and Belanger (2004) studied students' adoption of e-government and trust issues in the USA and reveal that relative advantages, compatibility, image and trustworthiness significantly affect the user's intention to use e-government services. In another study, Carter and Belanger (2005)

combined the Technology Acceptance Model (TAM), Web Trust Model and DOI to develop a conceptual model that contains relevant factors affecting citizen's adoption of e-government and revealed that compatibility, relative advantage and perceived usefulness are significant indicators of user's intention to use e-government services provided by the state.

Furthermore, based on Davis' (1989) Technology Acceptance Model (TAM); Dimitrova and Chen (2006) examined socio-psychological factors affect e-government adoption and identified perceived uncertainty and civic mindedness as salient factors, and Gilbert and Balestrini (2004) studied perceived barriers by integrate attitude and service quality based approaches.

Moreover, utilizing Ajzen's (1991) Theory of Planned Behavior (TPB) and TAM; Horst et al. (2007) examined perceived usefulness, personal experiences, risk perception and trust as the main determinants of the adoption of e-government services in The Netherlands, Warkentin et al. (2002) proposed a conceptual model and revealed that trust is the most significant factors affect the citizen's adoption of e-government.

Unified Theory of Acceptance and Use of Technology (UTAUT) was utilised among university students in developing country, Kuwait, and Qatar which are ones of the gulf countries (AlAwadhi and Morris, 2008; Al-Shafi and Weerakkody 2009) to examine the citizens' adoption of e-government. Both studies findings concluded that performance and effort expectancy, together with social influence have a significant impact among the decision of citizens to adopt e-government. The previous literature concerning the adoption of g-government from citizens prospective mainly utilised TAM and DOI models to identify the catalyst factors. The prior researches suggested that the core variables of the TAM were significant predictors of the adoption as well as compatibility variables in DOI and social influence in the TRA, TPB and UTAUT.

As a developing country, Saudi Arabia has attempted to respond to new technological advances by implementing a programme of e-government in 2005. The country accomplished a great deal in a short time, although the Saudi government started the project late. The plan was supported by clear vision and a strategic plan, top management support and the highest ICT investment in the region. Around 7.2 billion dollars was spent in 2010, which is forecast to increase to 46.3 billion SR (12.3 billion dollars) in 2015

(CITC, 2010). Changing demographic characteristics of the youth population, as well as increasing levels of education are likely to encourage e-government adoption in Saudi Arabia. E-government compatibility with gender segregation in Saudi Arabia, as well as females being prohibited from driving, together with the hot climate may form a catalyst for the adoption of e-government adoption in the country. Despite the greatest growth of the ICT market in the region and the economic prosperity of Saudi Arabia, the country suffers from a low level of e-government adoption by its citizens. Kransberg and Davenport (1972) commented that technological advances must not only be similar to existing technology, but must be compatible with existing cultural, economic and social institutions.

There are a number of other factors that may hinder e-government in Saudi Arabia, such as lack of awareness, social and cultural barriers, insufficient IT skills among the users, insecure infrastructure, lack of policy and legal requirements. It is also important to recognise certain requirements when introducing technology innovation to a conservative and religious society, such as Saudi Arabia, where religion is reflected in every aspect of daily life, and resists anything new that might affect religious adherence. The society's culture is religious in nature and Islam plays a key role in determining the community's traditions, social norms, patterns, obligations, privilege and practice. Islam is a comprehensive system, as well as a religious ideology, which embraces all aspects of Muslim life (Al Saggaf, 2004). The cultural characteristics of Saudi society include low individuality (social interdependency), the tribal system (social norm and nepotism) which reflected in social influence factor. A high uncertainty avoidance cultural value (face-to-face preference) is reflected in trust factor. High power distance (pyramidal class) is reflected in digital divides problem and facilitating condition factor. Additionally, sense of time (polychronic) cultural value which may leads to perceived benefits such as flexibility and accessibility. Conservative society and segregation of gender are reflected in the compatibility factor. These cultural values are likely to encourage or hinder the adoption of e-government amongst citizens.

The literature reveals little consideration of the cultural aspects of e-government. There are comparisons of two different cultures, the UK and the US, in two studies (Carter and Weerakkody, 2008) and between UK and Sri Lanka (Ali et al., 2009) that reveal the possible influences of cultural differences. Cross-cultural adoption of e-government in several European countries was researched by Arslan (2009); Kovačić (2005) and Khalil

(2011) studied the impact of national culture on the readiness of e-government implementation worldwide. E-government development was compared in five cultural dimensions across the world, as defined by Hofstede (Zhao, 2011). Cultural barriers and enablers that influenced the development of e-government in Malaysia, using an anthropological framework based on the Grid and Group Cultural Theory of Mary Douglas, was researched by Seng et al. (2010). Four cultural cosmologies – hierarchism, individualism, egalitarianism and fatalism factors that affected the implementation of e-government in two case studies within organisations in Malaysia were identified in the study.

A further study conducted by Chatfield and Alhujran, (2009) relating to e-government in the Arab world carried out a comparative analysis of e-government portals and websites revealing digital divides between developed countries and Arab countries, as well as between Arab countries. The literature gives little attention to the influence of Arab culture upon citizen's adoption of e-government, and it is hoped that this research will remedy this deficiency by investigating the effect of Saudi culture upon citizens' adoption of e-government, as well as proposing a conceptual model that takes account of relevant socio-cultural variables.

Heeks and Bailur (2007) suggested theoretical and conceptual research for this new area of study. This research will examine common models and theories that influence citizens' adoption of this new phenomenon and consider theories from different fields of study, which is due to the lack of adoption theories in e-government's field of research. The Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975) examines how culture affects individual behaviour, and is one example of this. This theory considers that attitudes lead to intention to perform certain types of behaviour, whilst intention can lead to actual behaviour. This intention to perform is influenced by the subjective norm, whilst in this study, culture may influence actual behaviour through subjective norms and attitudes that will ultimately impede or hinder adoption. The Theory of Planned Behaviour (TPB) (Ajzen, 1991) is an extension of TRA, which takes into account human and psychological behaviour, with the intention to perform certain behaviour being preceded by subjective norms, perceived behavioural control and attitudes. TPB included perceived behavioural control in order to involve people who have little control over their behaviour. The Technology Acceptance Model (Davis, 1989) is the most widely known model within the field of technology field that is based upon TRA and TBP by interpreting how users accept and use technology.



The acceptance of technology is the prime focus of TAM as an ultimate target for the models and the influence of perceived usefulness and ease of use towards personal intention to use the technology. The Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, Morris, Davis & Davis, 2003) brings together eight models and considers that effort expectancy, performance expectancy and social influence affects behaviour intention, whilst facilitating condition influences the actual use of the technology. This study will make use of the Diffusion Of Innovation Theory (DOI) (Rogers, 1995), in order to analyse the characteristics of technology adopters, as well as technological diffusion that is based upon diverse constructs, including complexity, relative advantage, image, observability, compatibility, as well as trialability. It was thought by DOI that individuals adopt new technology when they perceive benefits and less complexity, as well as discovering a system that is compatible with their personal beliefs and values. The innovation adoption process is described by Rogers (1983; p.21) as “the process through which an organisation passes from first knowledge of an innovation, to forming an attitude towards the innovation, to a decision to adopt or reject, to implementation of the new idea”.

TAM fails to provide a mechanism for the inclusion of other constructs due to the lack of simplicity in developing the model during the transition from TRA (Benbasat & Barki, 2007). However, UTAUT has tried to address this limitation by returning the social norms of TRA and the perceived behavioural control of the Theory of Planned Behaviour (TPB), although failed to return extension facilities and neglects the concept of attitudes and belief. Even though TPB and TRA are considered as theories of psychological and human behaviour, technology acceptance as an ultimate target for the models have been the focus of TAM and UTAUT, whilst DOI has emphasised the aspects of dissemination. The variables within this study were determined mainly from UTAUT, as well as including relevant variables from other theories.

In addition, this study makes use of the model of trust and risks in the adoption of e-government adoption in order to investigate the catalyst variables that affect citizens' adoption of e-government. This research will also consider the cultural aspects of society in Saudi Arabia, based upon Hofstede's national cultural dimensions. Finally, this research aims to synthesis these cultural aspects and adoption factors in order to develop a framework and theoretical module that will assist government agencies to identify the factors that stimulate users to interact online with government by investigating factors that

affect citizen's adoption of e-government, which is moderated by the socio-cultural dimension within Saudi Arabia.

In order to ensure consistency and compatibility throughout this research, a systemic literature review was conducted in order to examine previous literature that is related to the subject. In order to achieve the purpose of the research, the study extends the descriptive nature to the explanatory mode. The study will make use of an online quantitative questionnaire by surveying citizens from a heterogenic group in a diverse part of Saudi Arabia as a case study intended to represent developing Gulf countries. The study utilises a positivism philosophy, deductive approach and survey strategy to conduct the research to collect the required study data (Bryman, 2008). The utilisation of the quantitative approach is preferred due to the consistency and the objective judgment nature of results that could be generalised across larger populations, as well as from a variety of viewpoints (Bryman, 2008). The survey method is considered to be an appropriate tool for examining individual attitudes towards new e-government (Alawadhi & Morris, 2008; Al-Shafi and Weerakkody, 2009; Carter and Belanger, 2005; Carter and Weerakkody, 2008). This research also makes use of advanced inferential statistics techniques in order to analysis findings by conducting a factor analysis to extract the high loaded variables and a regression analysis to examine the relationship between variables.

## **Problem statement**

It is apparent that programmes of e-government may not be implemented as a universal model, because of political, cultural, economic and demographic factors that need to be considered. Saudi Arabia, in particular, has religious and cultural factors to be considered, which are critical to the success of how e-government is perceived, accepted and used by its citizens (Al-Sabti, 2005).

A systemic global survey to measure the development of e-government through an evaluation of areas of e-government development, such as e-services, infrastructure, human resource and e-participating was undertaken by the United Nations Department of Economic and Social Affairs (UNDESA, 2012). The survey revealed a rapid rate of development in Saudi Arabia within global rankings from 80 in 2005 to 70 in 2008 until it reached 58 in 2010, standing in 41<sup>st</sup> place in 2012. The index for Saudi Arabia is shown to be above the global average with regards to e-services, human resources and infrastructure,

yet is below average for e-participation (UN, *ibid*). A Saudi e-government programme, Yesser, conducted its own survey to measure the preparedness of customers to use e-government services. With a result of 82%, this survey revealed a high level of awareness of the programme, and a high score of trust of 92%, whilst usage and satisfaction remained at a low level with scores of 58% and 55% respectively (Yesser, 2011). It is clear that the perspectives of users should be considered as a means towards achieving high level rates of adoption when implementing citizen based e-government. Designing e-government initiatives for citizens is not an easy task, and especially in developing countries. This problem is due to the complex need for customisation of the technology, the context of implementation in developing countries, as well as specific issues relating to cultural and social issues (Heeks, 2006; Scholl, 2007). Centeno et al. (2005) considered some of the factors that could enhance the adoption and usage of e-government by citizens, which include: perceived benefits, quality and usability, availability of support, as well as addressing citizen' requirements through the provision of appropriate services.

One of the main reasons behind the failure of e-government implementation in developing countries is seen by Heeks (2003) as being the mismatch between design and reality. Ali et al. (2009) also suggested that most developing countries are relying upon external experts to implement the system, and this often fails to take into account national culture and the specific social context of the country, leading to failure in practice. In addition, most of the technology is designed and produced in developed countries and is culturally biased in favour of their own cultural and social systems. When Western technology is exported to developing countries, there are a number of possible cultural and social conflicts (Yavas et al., 1992). National cultural characteristics may have a significant impact upon the adoption of a system of information technology system in society, and may particularly influence the adoption of e-government among citizens (Venkatesh and Zhang, 2010; Al-Gahtani et al., 2007; Carter and Weerakkody, 2008; Arslan, 2009).

A possible remedy for the problem was suggested by Corea (2000), who commented that information and communication technologies should be self-cultivated rather than imported. Despite the importance of understanding cultural aspects and their influence upon the implementation of e-government development, research into this area remains limited (Seng et al., 2010). Earlier literature has focussed upon comparisons of cultural aspects within the development of technology, and its adoption readiness in various countries without considering the cultural emphasis of particular countries, and its likely

effects upon the adoption of new technologies. The influence of Arabic culture upon citizens' adoption of e-government has been insufficiently considered, and this research seeks to address this gap in knowledge by investigating the effect of Saudi culture upon the adoption of e-government by citizens, as well as proposing a conceptual model that embraces relevant constructs. Through the consideration of the literature relating to both culture and the adoption of technology, it is clear that it is not citizens who are at fault, but that technology should be matched to the culture of citizens in order to achieve greater acceptance.

## **Objectives of the Research**

A number of technical, political, organisational and soft social constraints confront the implementation of e-government, and this research seeks to investigate the demand issues of implementation by considering the adoption of e-government from the viewpoint of citizens. A consideration of issues associated with the low rate of adoption of e-government by citizens in developing Arab countries is the aim of this study, together with a predominant focus on the Kingdom of Saudi Arabia. The implementation of e-government should be tailored to the needs and choices of citizens, by taking into account the cultural, religious, traditional and other belief variables to ensure the dissemination and widespread adoption of the innovation.

Identifying the factors that affect the adoption of e-government from citizens' perspective by investigating psychological, technical and social factors, moderated by cultural values that influence their adoption of e-government is the main objective of this research. In addition, the ultimate goal of this research is to develop a conceptual model that embraces the catalyst constructs that affect citizen's adoption of e-government in Saudi Arabia. The conceptual model includes social, technical and behavioural variables that influence citizens' attitudes and beliefs when adopting this innovation, and with a consideration of cultural consequences.

## **Research Questions**

These research questions will attempt to address the aims of this study, which are:

1. What evidence is revealed for e-government relating to factors that could constrain and promote its implementation?
2. What is the most appropriate theoretical model that would enable e-government adoption by users, and particularly in Saudi Arabia, to be effectively analysed?
3. What are the factors that could affect the adoption of e-government in Saudi Arabia by its citizens in significant manner?

The following sub-questions will also be adopted from the main research questions:

With regard to adoption of e-government by citizens: What key factors could affect this?

- What are the key factors affecting the usage behaviour of e-government?
  - What are the key factors affecting the intention to use e-government?
  - How is the adoption of e-government by Saudi citizens influenced by demographic variables?
  - How is the adoption of e-government by citizens in Saudi Arabia influenced by national culture?
4. With regard to improving the adoption of e-government in Saudi Arabia: How could its implementation be redesigned?

## **Research Significance**

The significance of this research is justified by its focus on influencing factors regarding decisions to adopt e-government, such as socio-cultural aspects and citizens' characteristics, which should improve understanding that technology could offer benefits. This study will evaluate processes of e-government adoption in Arab countries that are often described as developing countries, and will provide a specific focus on the perspectives of citizens (G2C), as these areas have been insufficiently researched in previous studies.

This study also intends to emphasise the importance of national cultural dimensions that could be responsible for moderating individual, social and technical characteristics that influence citizens' adoption of e-government.

It is anticipated that these research findings will provide evidence to help governments and policy makers to tailor e-government services to the choices and requirements of citizens better, which should lead to a higher level of adoption and reflect the characteristics of users. Therefore, successful implementation of e-government will only achieve full benefits if adoption levels are high. This study will focus on Saudi Arabia, as this is a country with cultural values that are diverse, and within the new research field of e-government, it is intended that these findings will validate psychological, technical and social theories.

The dependent variables of usage behaviour, intention to use and awareness of the system have been used to consider various levels of adoption based on the UTAUT.

This study is also significant as it intends to enhance the knowledge within the literature by considering a wide variety of cultural factors when using the model to identify the adoption of e-government within other gulf countries (Kuwait, Qatar, UAE, Bahrain and Oman) which share similar socio-cultural values. Saudi Arabia shares similar customs, traditions, and tribal relationships with the other Gulf Cooperation Council (GCC) countries. Hofstede, (1991) analysis of the Arab world culture includes Egypt, Iraq, Kuwait, Lebanon, Libya, Saudi Arabia, and the United Arab Emirates, where the Muslim faith plays a major role. He found that Saudi Arabia is close to other Arab countries where Islam plays a significant role in the individual's life.

## **Thesis Structure**

This thesis has adopted the methodology developed by Phillips and Pugh (2000), so that its structure has four categories defined as novel contribution, data theory, focal theory and background theory. Chapters 2 and 3 will review the literature on this subject to consider the background theory, and to identify the research problem. Chapter 4 will then develop a conceptual model by considering the focal theory. An appropriate research strategy and method will be designed in Chapter 5 by considering the data theory. Chapters 6 and 7 will present and discuss the findings by considering this novel contribution. Therefore, the structure of this study will be presented in various chapters that are explained below.

## **Chapter 2: Research Framework**

Chapter 2 will evaluate e-government by examining its historical background from its early development, as well as e-commerce within the private sector, and its importance for the economy and prosperity of individual countries. This chapter will subsequently examine the influence of aspects, such as mandatory relationships, accountability, structure paradigm and accessibility, when comparing e-government and e-commerce. Then, this chapter will discuss the influence of technical elements, objectives, stockholders and the size of the project when identifying differences between public sector information systems and e-government implementation. In addition, definitions of e-government will be examined based on managerial, political, beneficiary and technical perspectives, and relational, external and internal approaches. E-government will then be categorised according to recognised parties, such as G2C, G2B and G2G, to explain those involved and potential benefits.

Then the life cycle and development of the system from pre-planning to advanced stages will be represented by extended classifications to include presentation, interaction, transaction and transformation stages.

This chapter will also attempt to define how government, businesses and citizens could benefit from e-government systems by discussing the influence of economic, managerial, social, technical and political aspects. These benefits will also be contrasted with barriers and challenges that often inhibit the implementation of e-government, such as human, organisational and technical constraints. The chapter will conclude by examining success factors that could enhance the process of implementation, and focus on critical factors that could affect the adoption of the system that might improve citizens' attitudes towards adoption and using new innovations, so that adoption of innovative systems could be enhanced.

## **Chapter 3: The Kingdom of Saudi Arabia: Background**

The intention of chapter 3 is to provide an overall background of the country and to discuss the unique characteristics of Saudi Arabia, which should expose the factors that are likely to hinder or promote the adoption of e-government. The current situation and the development programme and progression of e-government in the country will also be evaluated, and will begin by discussing characteristics of the country from its type of regime to its religious status.

This background information will include its culture, economic situation, climate, demographic information, topography and geographical location. This chapter will then use these characteristics and attempt to synthesise these with obstacles and motivations that could influence e-government adoption and implementation. Then, ICT statistics and the national IT plan for Saudi Arabia will be examined to identify different perspectives of the ICT sector.

This chapter will also examine how e-commerce in the country has been used to encourage the public sector to adopt e-government, and will evaluate the Yesser programme in Saudi Arabia that could be used to facilitate e-government projects. The e-government project will be examined and assessed by evaluating the programme's components, objectives and plan. This chapter will attempt to focus on the m-government system within Saudi Arabia, as part of its e-government system, as well as other national initiatives of e-government systems in the country. Finally, this chapter will discuss the research relating to Saudi Arabia relating to e-government adoption.

## **Chapter 4: Theoretical Research**

To ensure that the intended model has a secure foundation by including critical factors for adoption of e-government, chapter 4 examines the conceptual research paradigm and theoretical background. However, currently theoretical concepts remain insufficient as e-government is a relatively new field of study, so this study will evaluate models and theories from other research fields, such as technical, social and psychology, and attempt to apply these to theories regarding e-government, so that potential variables influencing the adoption of e-government from the perspective of citizens might be defined. There will be an emphasis on the trust model, Unified Theory of Acceptance and Use of Technology model (UTAUT), diffusion of innovation theory (DOI), technology acceptance method (TAM), theory of planned behaviour (TPB) and theory of reasoned action (TRA). This chapter will also adopt a conceptual framework for developing and developed countries as a basis when reviewing previous studies related to technology adoption, but with a focus on e-government adoption research. This will attempt to explain how cultural differences between various countries create important factors that can influence citizens' intention to adopt e-government.



Then, with a focus on e-government adoption, this chapter will examine the impact of cultural aspects on technology adoption, as well as using the culture model developed by Hofstede and other researchers to discuss the socio-cultural dimension of Arab countries, but with a specific focus on Saudi Arabia. The five cultural dimensions defined in the Hofstede model, which are Masculinity/Femininity, Individualism/Collectivism, Power distance, Long-term orientation and Uncertainty avoidance will be discussed.

The research hypotheses will be developed in this chapter by focusing on the critical factors influencing e-government adoption by citizens, but with a specific consideration on how e-government adoption could be influenced by cultural aspects in Saudi Arabia. This chapter will conclude by achieving one of the objectives of this empirical research with the proposal of a conceptual model for the adoption of e-government for Saudi citizens that includes cultural, behavioural, demographic, social and technical constructs.

## **Chapter 5: Research Design**

The intention of this chapter is to explain how the research questions of this study will be answered by developing a systematic plan and procedures by reviewing previous literature relating to research design. The relationship between the research and the theory will be investigated in this chapter, which should lead to presenting the most suitable approach for this current study. To select the most appropriate category for the purpose of this study, the chapter will examine predictive, analytical, descriptive and exploratory classifications. In addition, the chapter will investigate the philosophy of the research based on various global assumptions. Therefore, the most appropriate research method will be determined based on its ability to answer the research questions, and consistency with research philosophy. This will be achieved by analysing various philosophies and different methodologies within social research methods, so that different choices correlating with the research method determined can be applied by the research strategy. The most appropriate sampling method for this study will be validated by considering various techniques of sampling. The chapter will explain how the most appropriate instrument for this research with regard to the data collection method was determined to be a questionnaire survey. This chapter concludes by explaining the reliability and validity criteria of the study, how the survey was piloted, translation of the questionnaire and the design of the questionnaire, as well as defining how participants' rights were maintained and examining the ethical issues relating to this research.

## **Chapter 6: Data Presentation and Analysis**

Chapter 6 will use simple descriptive and advanced statistics to present the findings and analysis of the survey, which will begin with a preliminary analysis to ensure the accuracy of the data, as well as analysing missing data and outliers. The validity and reliability of the data will then be considered, as well as the use of charts and tables for descriptive analysis, so that raw data can be understood better. The chapter will conclude by using factor analysis and regression test to evaluate the correlation between variables, so that inferential statistics will be exposed.

## **Chapter 7: Discussion**

Chapter 7 will discuss the factors affecting citizens' adoption of e-government in Saudi Arabia in depth, as well as the key findings of the research that will be synthesised with the findings of previous studies and the current research. Subsequently, this chapter will evaluate the proposed research hypotheses, and use previous literature and cultural values to interpret the outcomes. The chapter will conclude by re-evaluating the conceptual model suggested in chapter 4, and suggest a revision of the model based on the empirical findings of this study. Therefore, UTAUT will be revalidated with a unique model that includes factors relating to citizens' adoption of e-government in Saudi Arabia.

## **Chapter 8: Conclusion**

Chapter 8 will present the final results of this study as a summary and conclusion, which will include giving recommendations for further research, limitations, implications for research and practice and answering the research questions.

# Chapter 2:

## Research Framework

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### **Introduction**

This chapter intends to present a review of the literature on the subject, and to discuss the scope of this research area by adopting critical analysis. The chapter will begin by presenting an historical background of establishing new phenomena, and subsequently e-government and e-commerce will be compared by attempting to clarify the diverse findings revealed in the literature between e-government and Information Systems (IS) initiatives in the public sector. The chapter will then discuss how e-governance and e-government differ from the review of the literature, and will explain various definitions from this context by varied researchers. Then the chapter will categorise e-government by using different approaches to present an in-depth insight, by evaluating those parties that have an involvement in the life cycle of the system and those who are responsible for the developing progression of the project. The benefits of e-government will then be discussed and how these could affect the general public, private sectors and public sectors, as well as highlighting the challenges and constraints of implementing this technology. The chapter will conclude by examining success factors that enable the effective implementation of e-government, and suggest what critical factors are likely to influence whether end users will adopt the system.

### **E-government background**

Information societies have been created by the rapid growth of the use of the Internet across the world, and where there is good access to this technology, the lifestyle of people in society has been changed by Internet facilities. The Internet has been widely adopted for commerce, and e-commerce has become a generally accepted method for selling and buying products and services through the Internet. However, e-commerce expanded its scope to extend the practices and processes of business, which led to the development of e-business in the private sector.

As a result of these rapid changes by using new technology initiatives in the private sector, the public sector began to examine how this new technology could be adopted and how paper-based government administration and communication could be changed into electronic formats. The first websites offering electronic services began in the public sector in 1990 (Ho, 2002). These initial services provided the public with electronic services that were efficient, fast and cheap, and e-government developed as a concept that was closely aligned to that of e-commerce.

According to Heeks (2006), e-government is an information system, and not simply a facility for the general public to use the Internet, and this information system extends beyond the technological aspects of IT, but uses IT elements, the critical information required and the people who have created and maintain the system through the processes that the system adopts (Heeks, 2006). Other findings have suggested that the technical elements of e-government are only one small part that contributes to its success or failure, and other elements that will influence the effectiveness of e-government include cultural, social, human and organisational factors (UN, 2012).

Moon (2002) explains that e-government systems have rapidly been implemented by developed and developing countries, but these implementation programmes have varied widely in their scope and effectiveness regarding the extent and benefits provided by the application. This may be explained as nearly all countries having established a government presence on the Internet with a website, but their interactivity for users range from one way communication only to interactive communication on a two-way basis, as well as systems offering full interaction and financial transaction capabilities. However, Hood and Margetts (2007, p6) suggest that the ability of governments to achieve various stages of implementation will depend on their ability to use detectors and effective tools to control the physical entity of its organisation, its ability to exchange value to demonstrate treasure, to establish an official or legal sense of authority and to create a central information system as its node. According to Bhatnagar (2004), to plan and monitor the process of e-government from its earliest stages, Information and Communication Technology (ICT) should be used to create a management information system. In contrast to objectives of enhanced efficiency for government processes, Kaylor et al. (2001) found that some governments had identified an ultimate aim of e-democracy and e-participation for all individuals in society, so that they can participate in political decision-making.

According to Al-Shehry et al. (2006), there are many barriers that prevent the effective implementation of e-government in spite of the proposed benefits for the general public, private businesses and government agencies, as governments cannot purchase an established software program. Despite the significant progress of e-government development in the last decade, many countries across the world have experienced problems in implementing e-government systems, and most have remained at the early stages of the implementation (Sivarajah and Irani, 2012). Heeks (2008) studied the success of implementing e-government in developing countries, and reported that there was complete failure for 35% of these programmes, 50% had partly failed and only 15% were considered to be successful. Whereas regarding the implementation of e-government in Arab countries (Al-khouri, 2013) stated *“Based on our knowledge and interaction with e-government initiatives in the Arab world, we tend to argue that the majority of e-government in Arab countries fail and are stuck in the Access phase of Forrester's maturity model. The other evolved Arab countries in e-government are still in the early steps of the interaction phase”*. Forrester's maturity model portrays three phases to evaluate e-government transformation namely access era, interaction era, and integration era.

The patterns of the processes used by e-government and e-commerce systems demonstrate strong relationships and similarities, but in terms of research fields and practice, they remain distinctly different. In addition, the review of literature exposes misunderstanding and doubt regarding e-government and information systems in the public sector. Therefore, the next section will attempt to clarify the differences between e-government and e-commerce, before the concept of e-government can be examined in depth.

## **E-government and E-commerce**

According to Tung and Rieck (2005), virtual applications made possible by e-government enable the general public to carry out government transactions that offer convenience, high quality and low cost, so that this accessibility and efficiency can help governments to match the benefits achieved by the private sector by using new technology to increase profits, increase revenue and lower costs. Heeks (2006) argues that there is a greater likelihood of success for government to business (G2B) systems than government to citizens (G2C) systems, because businesses already have an effective infrastructure to cope with electronic transactions, as well as prior experience with this technology.

Carter and Belanger (2004) explain that as e-government and e-commerce both use new technology to exchange services, information and goods, e-government could be defined as a development of e-commerce, or an example of this system.

These findings presented the benefits of accessibility from any location for individual users on a seven-day-a-week and twenty-four-hour basis, but also argued that as services lacked a face-to-face contact, its success would be determined by the level of trust shown by these consumers or citizens (Carter and Belanger, 2005). Laudon (2003) explains that e-commerce has similarities with e-government, as e-commerce includes consumer to consumer (C2C), business to business (B2B) and business to consumer (B2C), whereas e-government includes government to government (G2G), government to business (G2B) and government to citizens (G2C) elements (Carter and Belanger, 2002). Therefore, by examining the G2C and B2C elements, both are using the same terminology to provide consumers with goods, information or services quickly, contentedly and efficiently. Furthermore, both are facing the challenge of security and privacy issues due to online transactions.

However, Jorgensen and Cable (2002) argue that in terms of accountability, structure and access, the patterns of the systems used by e-commerce and e-government differ significantly. In examining e-commerce, businesses limit access to those customers who are competent in using the Internet, and the company can target or select their customers, but for e-government, the entire population of a country needs to be able to access the services, including those with disabilities and low incomes, which exposes the problems of the digital divide (Carter and Belanger, 2005). Moon (2002) exposes another difference between e-commerce and e-government, as in business decision makers and management structure are generally more centralised than when compared with government agencies, and this limits the potential of e-government services developing. Another difference exposed by Jorgensen and Cable (2002) was accountability that is considered in the private sector as having greater freedom, but in contrast, the public sector has to comply with legislation to provide citizens with the best services.

Warkentin et al. (2002) also point out that the commercial objective of reducing costs and increasing profits of the private sector is critically important, but e-government has an overall objective of providing the best services for citizens according to its legislation and political views that are critically important. These differences were also recognised by Fairweather and Rogerson (2006), who argued that there was a difference between e-commerce and e-government due to political influence in e-government, and the impact of legislation and policy decisions on citizens.

Consequently, these differences in the targeted users, main objective, degree of freedom and centralised nature of the services should be considered during the planning stage of the implementation and avoid transferring the technology from private to the public sector. It is important to consider the similarities and differences between e-commerce and e-government in order to compare the implementation process and assess the adoption level among the two environments.

More problems can be created than resolved if managers from government departments adopt private sector approaches were the findings of Coddard and Riback (1998, cited in Heeks, 2006), who also claimed that government should not be perceived as a business. Heeks (2006) also explained that e-commerce and e-government differed in various ways, such as the public sector has a weaker infrastructure, greater scale of political influence, but lacks the nature of competition exposed in the private sector; and there is a broader objective for the public sector whose customers or citizens have a complex relationship as perceived stockholders in terms of accountability, regulations and roles than the private sector.

This perception and argument explains that e-commerce is different from e-government, and e-commerce packages may not be suitable for e-government, as the reasons for adopting e-commerce remain different to adopting e-government. However, e-commerce packages have been used by researchers to apply and implement e-government practices, such as Customer Relation Management (CRM), for local government departments in the UK to help transformation of the service and meet expectations of citizens (King and Cotterill, 2007). As a result, CRM is considered by local authorities as critically important in e-government to maintain records of individual's information, expectations of the needs of individuals and directing them towards appropriate services (King and Cotterill, 2007).

Also, the public sector exposes confusion between information systems or information technology projects and e-government, because information systems have symbolic, organisational and technical elements that are subject to reorganisation and expansion during Information System Development (ISD) to meet the needs of an organisation (Lyytinen and Newman, 2006; p.4). The definition of information systems proposed by Laudon & Laudon (2007, p. G-7) suggested that IS is *“Interrelated components working together to collect, process, store, and disseminate information to support decision making, coordination, control, analysis, and visualization in an organization”*.

Although these findings classify e-government as information systems and reveal similarities between information systems and e-government to some extent, differences are exposed when considering the size of project, stockholders involvement, objectives and technical elements.

Information systems are automated by one organisation to satisfy its limited clients' needs, but e-government systems are automated for various government agencies to satisfy larger sample of citizens. A single organisation can restrict access to its information systems to its location and times of working, but e-government sought more accessibility and flexibility. Most information systems are centralised with homogeneous applications, but e-government systems generally use web-based services that are decentralised with heterogeneous applications. Finally, e-government creates a relationship for stakeholders that is direct and intensive, but single IS within organisations operate in more indirect relationship with their stockholders, who also have less numbers involved.

Therefore, this review of the literature on this subject has revealed that overall e-government systems have been formed from various integrated information systems that use a communication technology that has a very wide base, so that its implementation can be managed on a national basis effectively and efficiently. These new phenomena of e-government have been focused on various users, and as a result, the benefits have varied according to the different approaches adopted. Therefore, the definition of e-government can be determined by examining these different approaches, which will be explained in the following section.

## **E-government Definition**

Firstly, it is important to examine how the concepts of e-government and e-governance differ before forming a conclusion to define e-government by highlighting the varied approaches and different perspectives. This is particularly important, as some researchers have used e-governance and e-government to explain how electronic services are provided for the public sector.

To separate the definitions of these two concepts, Palvia and Sharma (2007) explain that the concept of e-government is focused on stakeholders beyond the immediate scope of government departments, but e-governance is focused on management tools and administration with government departments. E-governance is defined by Sheridan and



Riley (2006) as a broader concept of applying ICT within the public sector, but e-government is defined as the simple development of online services. Therefore, the concept of e-governance could be focused more on control, authority and power, whereas the concept of e-government is focused more on online services.

The review of the literature reveals little consensus of agreement for a clear definition, because the varied definitions of the concept are based on different approaches and perspectives. Some literatures defined e-government from narrow prospective of internet enabled government application and automating the current applications while others viewed the concept from a broader perspective which include using the ICT in government to reform and government process reengineering.

Hirst and Norton (1998) suggest three categories to define e-government:

- Internal - this relates to a government's horizontal transactions among the government agencies,
- External - this relates to a government's vertical transactions between users and government, and
- Relational - this relates to how a government integrates its horizontal and vertical approaches.

Accordingly, the concepts of e-government systems are defined by Grönlund (2002; p.1) as external and internal relationship transactions as *“e-government involves not only the transfer of technology but also the reinvention of internal procedures in the organization in terms of both the internal (administration) and external (services) implementation of the technology”*. Whereas Tapscott (1996) defines e-government from the horizontal or internal transaction as it links internal legal systems with the new technology, and the infrastructure for government information is linked externally that can be accessed by voters, business customers, suppliers, tax payers and all institutions in society.

However, the OECD (2003) e-government can be defined within three classifications:

- Online delivery of applications and Internet services,
- An ICT system for managing online government transactions, and
- The capability of transforming government administration by adopting ICT.

The definition of e-government systems was described by the OECD (2003; p.23) as achieving better government by using information and communication technology as a tool, and specifically the Internet, but requires political reasons for this technology to be applied.

Moon (2002; p.2) defines the concept of e-government in terms of its use of ICT as all forms of this technology, such as fax machines and smart phone devices to support the day-to-day administration of government. In developing countries, e-government is defined as the use of ICT to make government processes more effective and efficient, make their services more accessible, give individuals greater access to information and ensure greater accountability of government to citizens, as well as possibly providing services through wireless devices, community centres, telephone and the Internet.

The main reason why processes of e-government often fail is described by Ndou (2004) as misunderstanding the functions and processes of e-government, and its concept being defined too narrowly, but in contrast, Yildiz (2007) believes that the potential of e-government is limited because it has no standard definition and its concept is widening. The framework of e-government is categorised by Ndou (2004) into:

- Internal, external and rational elements that form the transformation area,
- Government departments, businesses, government employees and citizens that form the actors, customers and users, and how they interact, and
- E-administration, e-democracy and e-services that form government application domains.

However, we could classify e-government definition in the literature into four main views which embraced information technology utilisation, process and development of e-government, citizens' focus, benefits of the system and the political view.

The utilisation of the technology by the government departments to fulfil various functions was considered in defining e-government by (Zakaria and Gebba, 2012) "E-Government is a public system of information and communication technology applications fulfilling different functions such as processing, filing and retrieving of information".

Global definitions of e-government have been presented by the United Nations and the World Bank, and the United Nations (2012) identified its benefits for citizens as its critical importance as it used the Internet to deliver services and information for citizens. The World Bank (2012) identified the benefits in terms of reforms of the public sector and benefits to citizens when government departments use mobile computing, the Internet and Wide Area Networks and other technologies to change relationships between government departments, businesses and citizens, because they enable more efficient government management, the empowerment of citizens by better access to information, enhanced interactions with industry and businesses and improved delivery of government services to citizens. As a result, the World Bank claimed the benefits would include cost reductions, revenue growth, greater convenience, increased transparency and less corruption.

In a study of the benefits of e-government and its life cycle, Abramson and Means (2001; p.2) defined the concept as information and transaction exchange by electronic interaction between employees, businesses, citizens and government. However, in defining the management aspects of e-government, the European Information Society (2004; p.20) considered the political advantages and management of change and suggested that *"The use of ICT in public administrations combined with organisational change and new skills in order to improve public services, democratic processes and strengthen support to the public policies"*. Therefore, the concept of e-government would include the dimensions of e-citizens, e-society, e-services and e-administration (Ndou, 2004; Perri, 2004).

These findings have demonstrated that attempts to define e-government have resulted in various classifications of the system, and that e-government also includes sub-classifications to its system to include citizens, the private sector and the public sector. As a result, the next section will examine how e-government has been classified in the review of the literature and the different perspectives revealed.

## **E-government cataloguing**

The review of literature has mainly classified e-government systems in terms of the benefits it offers, which creates a sub-division of the system, but e-government has also been classified by relating it to the life cycle of the development of the project or to the level of its implementation.

## **E-government Sectors**

Other government departments, businesses and citizens are the main focus for e-government systems, as these are classified as either participants or beneficiaries, so a general categorisation has evolved that forms three elements:

- Government to citizens (G2C) - this includes all electronic services provided for citizens by government departments,
- Government to business (G2B) - this includes the interaction of the public sector with the private sector, and
- Government to government (G2G) - this includes internal transactions between government departments (Holmes, 2001; Bonham et al., 2001).

This classification was extended by Ndou (2004), who enhanced the (G2G) sector by including a government to employee (G2E) sector, which covered the interaction of employees of government departments and the government. Another researcher has also enhanced this e-government classification model, as Fang (2002) recognised the government to non-profit sector (G2N), as this identifies the electronic transactions between social and political organisations and government.

### **Government to Citizens (G2C)**

Government departments can use the online medium of G2C to deal with all matters relating to citizens (Chun et al., 2012) which could include a wide range of interactions between government and citizens, such as communicating, facilitating and exploring, which should lead to better engagement of citizens, including e-democracy and online voting to enhance political engagement, as well as basic government services such as paying online, booking appointment, and renewing passports and licences (Riley, 2001).

According to Seifert (2008), the success of the implementation of e-government could be measured by how citizens have become involved and adapted to these new processes, and this makes G2C the central objective and most significant element when implementing e-government systems. Therefore, as the current generation becomes exposed to greater G2C interaction over the coming years with this new technology, they will become the main users of the system in future years (Seifert, 2008). Indeed, G2C sector opens a transparent channel between the government and the individual resident leading to citizens-centric-government which is the aim of most global governments towards the democracy. In this research we will consider G2C sector as the citizens' adoption consider as an efficient method to evaluate the success of the implementation.

### **Government to Business (G2B)**

G2B occurs when there are electronic transactions between the private sector and the government, and is mainly applied for developing the online market place for governments and e-procurement system, as well as providing services and products to businesses in the private sector (Fang, 2002). The interactions of G2B enhance the consistency of intensive tasks for personnel, as well as streamlining the process (Seifert, 2008), which has benefited from the private sector's previous experience of e-commerce and other online services, and recognition that these electronic services contribute to improved competition and lower costs.

### **Government to Government (G2G)**

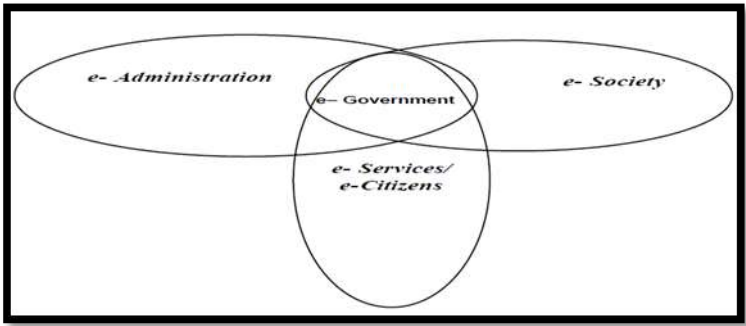
Behzadi et al. (2012) explain that G2G integrates the organisation of local, state and federal government information into one database, and this forms the core of the framework of e-government systems. Therefore, as the requirement to share data between different government departments that needs highly proficient advanced technology, this sector has been described as the ultimate goal for all governments. As a result of these centralised transactions, government departments can use this single access point to improve outcomes, effectiveness, save time, reduce costs, improve efficiency and enable greater consistency (Seifert, 2008).

### **Government to Employee (G2E)**

The G2E sector was originally perceived to be an element of the G2G sector, but Ndou (2004) identifies this as a unique sector as it focuses on the relationship between government employees and government departments, so that employees become more involved in decision-making at management levels, as well as career development through the use of e-training and e-learning courses. According to Fang (2002), this sector should contribute to creating e-office environments that are paperless for civil services. Riley (2001) argues that when governments develop strategic plans to adopt e-government systems, these should include G2E, as well as accounting, human resources and budgeting.

Exploiting e-government interrelations is described by Heeks (2001) as applying three basic elements, such as computerising and automating the tasks of government agencies, and improving the management functions of the process through e-administration. Another element would improve the connection between citizens as users of the system and government departments by focusing on the electronic transactions of e-services and e-

citizens. Finally, e-society is an element that extends the scope of this interrelation beyond previous boundaries, such as the general public, the private sector and the public sector. Therefore, Ndou (2004) argues that the overlapping points of these three elements encapsulate e-government systems (see Figure 2.1). In contrast, four different segments are proposed by Nordfors et al. (2006) to classify e-government, which are e-governance, e-management, e-services and e-democracy. These findings were adapted by Poon and Huang (2002) who replaced e-governance with e-commerce as the components for e-government systems.



**Figure 2.1: E-government components. Source (Ndou, 2004)**

However, e-government components may not applied on practice and might not be limited to e-administration, e-society and e-services as the system comprises various components such as the re-engineering process, e-business and these components are changeable with different governmental applications.

### **E-Government Stages**

The life cycle of e-government systems is developed over several stages from pre-planning stages to advanced stages that define the final pattern of the system, but this development of stages is not always a sequential pattern, as some governments decide to miss one stage and move the next stage (West, 2004). According to Gupta and Debashish (2003), the different perspectives of management, organisation and technology will define the classifications of e-government that could vary significantly across the development stages. Considering the complex, evasive and long-term nature of transformation, much research focuses on stages of growth models that both describe and provide guidance for the development of e-government initiatives (e.g. Andersen & Henriksen 2006; Layne & Lee 2001; Chen 2003; Gupta & Jana 2003; West 2004; U.N. 2002). The idea behind these maturity models is that transformation is expected to happen stage-wise, starting off from developing an information system and, eventually leading to transformed government.

Gartner Group (2000) devised categories for the stages of e-government that have become widely adopted, and included four evolutionary phases for the life cycle of e-government development that were: presence, interaction, transaction and transformation stages. Figure 2.2 shown below illustrates these stages.

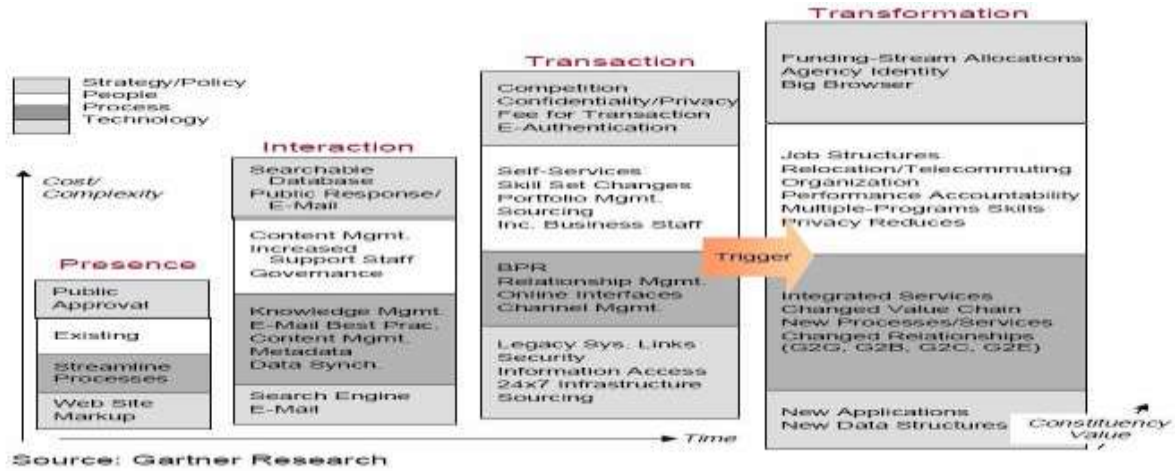


Figure 2.2: Stage of e-government. Source (Gartner Group, 2000)

### Presence Stage

Abunumy and Mayhew (2007) explain that the first stage of developing e-government systems relates to publishing an Internet website for the government department, and is regarded as having simple technical elements to provide information about the government agency, such as opening times, telephone numbers and addresses. Citizens benefit from this facility as they have better access to the service from any location and at any time of the day or night. Research findings have recognised the significance of this first stage for citizens and government departments, and the presence stage has been further divided into stages described as emerging, enhancing and interactive (United Nations and American Society for Public Administration, 2001), but this view is not supported by Abanumy and Mayhew (2007), who argue that these three sub-stages are inappropriate, as one simple stage is sufficient for e-government development.

### Interaction Stage

The interaction stage enhances the website features of government departments by including search engine facilities, so that citizens can use feedback forms or emails to communicate with government departments. This interaction stage also enables official forms to be downloaded by citizens from government websites, or to complete these forms online and then print out a copy. However, some researchers have perceived this stage to involve communication on a one-way basis, and is also known as an intake process.

## **Transaction Stage**

This stage needs highly skilled human resources and complex IT capacity, and is considered to be an advanced stage of implementing e-government systems, and when operating successfully, citizens should be able to carry out complete government tasks online, such as applying for a passport, renewing a licence, and making online payments without travelling to government offices. Some researchers have perceived this as a complete transaction stage or one offering two-way communication. However, Irani et al (2006) identify this stage as where most e-government systems fail, and is of critical importance to achieve success, as governments will otherwise not be able to move to the next stage of transformation.

## **Transformation Stage**

This is the stage that is the ultimate aim for most governments across the world, as it represents the full implementation of e-government systems, but researchers define this also as the stage requiring the greatest sophistication (Atallah, 2001; Layne and Lee, 2001). During this stage, all information is integrated into a central database from all government departments, so that information regarding businesses and citizens can be accessed by different government agencies from one place. Therefore, the process of integration should enable the government to monitor and plan the data effectively and efficiently, as well as avoiding the need for citizens to complete their personal information repeatedly.

However, some researchers point out that this advanced stage requires additional budget allocation and significant effort of personnel, as well as complex technology requirements, so Deloitte and Touche (2001) have proposed that this stage be subdivided into:

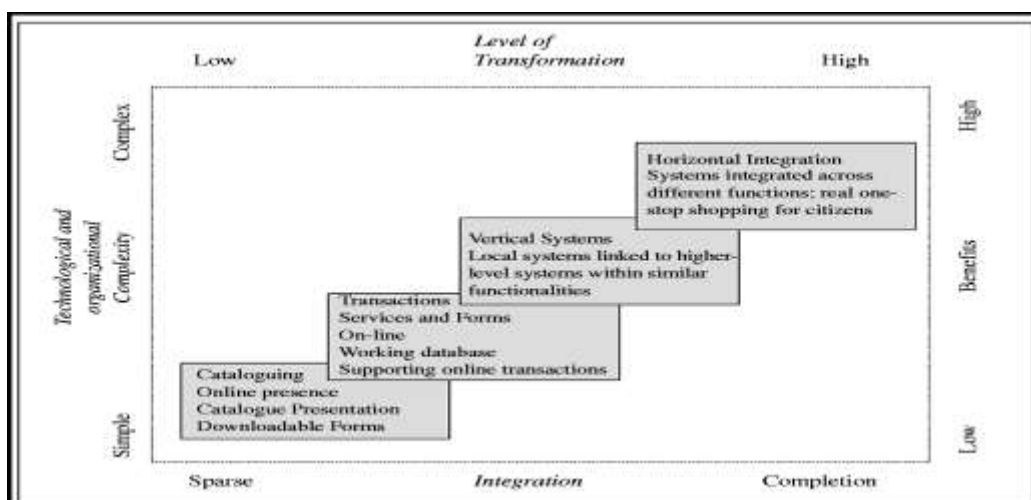
- Multi-purpose portals - this would mean individual websites to serve users,
- Portal personalisation - this would mean that users could customise the services according to their needs,
- Clustering of common services - this would mean services would be provided seamlessly by combining common services into standard transactions, and
- Full integration - this would mean full enterprise transactions that should produce an ideal service.



The classifications of e-government have been defined by various researchers with names that are different, but have meanings that are similar. Chandler and Emanuels (2002) and Lau (2001) proposed development stages with categories of information publishing, two-way communication, transaction and integration, but Cap Gemini Ernst and Young (2006) suggested the stages of development should be online presence, one-way interaction, two-way interaction and transaction. However, there is a shortcoming in Howard's (2001) study because it doesn't embrace the integration stage. This is important because it is only the integration stage that facilitates any flow of government information between different levels of agencies and departments

Furthermore, the development of e-government life cycle was categorised by Layne and Lee (2001) as organisational, degree of integration and technical perspectives and described as:

- Cataloguing phase - this relates to static information on an Internet web page,
- Transaction phase - this relates to citizens using emails and online forms,
- Vertical integration - this relates to integrating government services that have the same functions into one website portal, and
- Horizontal integration - this relates to integrating the various functions of different government departments into a stage that is seamless as Figure 2.3 demonstrates.



**Figure 2.3: Stages of e-government. Source Layne and Lee (2001)**

Although, Layne and Lee model didn't mention the interaction stage, they contributed to the stage development literature by differentiating between the vertical and horizontal integration phases.

In contrast, Moon (2002) presents different classifications of life cycle stages of e-government based on user interaction and the sophistication of the technology and defined as:

- Simple dissemination of information - this relates to one-way communication when an Internet website can be viewed by citizens to find information,
- Request and response - this relates to two-way communication when the technology enables data and emails to be transferred between citizens and government departments, as an interactive medium,
- Service and financial transactions - this relates to financial services that can be carried out online by citizens,
- Horizontal and vertical integration - this relates to intergovernmental integration vertically and intragovernmental integration horizontally into one database, and
- Political participation - this relates to engaging citizens with political decision making, such as contributing to public forums online, expressing their opinions and voting online.

Hiller and Bélanger (2001) have similar classifications of e-government development stages as Moon when they emphasised on the political participation stage and categorised the stages into five phases which are information, two way communication, transactions, integration and political participation.

United Nations DPEPA (2002) categorised the stage of e-government development into five phases which are:

- Emerging stage by creating government website with limited static information.
- Enhanced stage by updating the information regularly.
- Interactive stage provides more features for the users enabling them to interact with agencies through the email or download forms.
- Transactional stage which allowed the users to complete online transactions.
- Seamless or fully integrated which provides services across administrative and departmental lines with the highest level of integration.

In the United Nations report 2010 (UN, 2010), the development stages are reduced to only four: Emerging stage and enhanced stage which resembles the emerging presence and enhanced presence in 2005 maturity model (UN, 2005). The EU benchmarking framework is composed of five stages (information, one-way interaction, two-way interaction, transaction, integration).

The EU stages are somehow similar to those of UN where information stage reflects the emerging and enhanced stages in the UN model, while the one-way two-way interaction stage and transaction stages resemble the interaction stage.

Three categories of e-government development are suggested by Dunleavy and Margetts (2002), who identify basic site, e-publishing and interactive as the main stages. Therefore, the basic site provides information such as addresses, email contact details and telephone numbers, which is described as an advertising poster. A more dynamic Internet website is adopted for the e-publishing stage, which would have many pages and enable citizens to download forms. Finally, the interactive stage enables citizens to interact with various government departments.

According to West (2004), there are four stages for the development of e-government, and these classifications are based on changes in an approach that is centred on citizens, and defined as:

- Billboard stage - this relates to the posting of reports by government departments for citizens to access,
- Partial services delivery - this relates to the stage when citizens can carry out or request some online services,
- Portal stage - this relates to services that are fully integrated and can be carried out by citizens, and
- Interactive democracy - this relates to encouraging political participation by citizens through e-government facilities.

Despite the variety of these stage models, they were criticised as neglecting the political transformation, ignoring the reengineering process and did not cover and capture the 'true' meaning of the stages (Siau and Long, 2005). Furthermore, some researchers reject the idea of sequential evaluation model of e-government development and claimed that it has no theoretical validity. Consequently non-normative models are developed which emphasis on users centric and rely on classifying e-services with no difference between them in terms of better or best e-service such as Diamond Model (Goldkuhl and Persson, 2006), Eco model (Lind et al., 2007) and ESI model (Zakaria and Gebba, 2012).

This review of the literature on this subject has revealed that the evolution of e-government systems demonstrates wide differences in terms of characteristics of these stages that are based on the perspectives of each researcher. These findings have shown that some researchers have focused more on IT and technical issues of e-government, but others have adopted a citizen-based approach, whilst others have concentrated on organisational elements. However, most researchers have demonstrated agreement on the early stages of this developing framework for providing Internet websites for government information that begins to implement e-government systems. More recent research has focused on e-democracy in the final stage to encourage citizens to participate more in political decision-making. In fact, the level of adoption is considerably affected by the progression stage of the implementation which will be discussed later.

Most governments across the world have been stimulated to adopt e-government despite its cost and complexity, so this exposes the need to question why so many countries have taken this direction and what benefits they perceive of this system. Therefore, the next section will attempt to respond to these questions, as well as to expose how the implementation of e-government will achieve benefits.

## **E-government opportunity**

Most governments across the world have implemented e-government systems due to their perception of the value that can be gained by applying the elements of this system effectively. Overall, few researchers have questioned the effectiveness of implementing e-government systems, and the potential benefits of e-government are mainly targeted towards the business sector, citizens and government departments.

Bhatnagar (2004) describes the benefits of e-government systems as being focused on reducing corruption in administration and increasing transparency, which would improve the effectiveness and efficiency of government services. He also explained that improving government's service delivery was as important as improving the performance of public services. Nkwe (2012) also argues that e-government can empower citizens to overcome the digital divide, reduce intermediaries and reduce costs. Warkentin et al. (2002) explains these benefits by giving the example of the Internal Revenue Service in the US that reduced its costs for printing, sorting and posting tax forms by adopting a website for tax services and made savings of millions of dollars each year. Chavez (2003) also explains that by reducing transportation fuel, paper and pencils, e-government has made an effective contribution to a greener environment.

The OECD (2003) focused on the aspects of reforming public management as the main benefits of adopting e-government systems, and argued that e-government enhances citizens' trust relationship and engagement, helps to advance the agenda for public reforms, contributes to economic policy objectives, enables a better output, improves the quality of the service and enhances efficiency.

According to Gautrin (2004), there is an empirical role of e-government to improve the lifestyle of citizens, as the world is transforming into an information society, and so the technology encounters the life aspects by providing services that are convenient and comfortable for users. E-government improved the accessibility of the services as services can be accessed from any location and at any time of the day and night, so that citizens are more satisfied with the services provided (Stiftung, 2002; Terpsiadou and Economides, 2009). Citizens also benefit from reducing costs of e-government, as they do not need to spend money on travelling and save time waiting in queues (Buckley, 2003; Drinjak et al., 2001; Marshall, 2001).

Chavez (2003) also supports these benefits for citizens that overcome the problems of finding a parking space at a government department or waiting in a long queue, so citizens will appreciate the value of using online facilities for government transactions. Jackson and Curthoys (2001) identified better productivity and cost savings, as benefits that have a direct impact on customer service. However, an exploratory study of UK local authority websites found that the digital divides and citizens' age could control the benefits of e-government and the opportunity of the system is relative among the users (Choudrie, et al 2013).

Seven benefits of adopting e-government systems were presented by Chevalleriau (2005) for citizens and government that were:

- Better quality of information supplied,
- Less time spent on work processes,
- Reduced burden for administration,
- Lower operational costs,
- Improved level of services,
- Better work efficiency, and
- Enhanced citizens' satisfaction.

E-government offers numerous benefits if it's implemented appropriately, and these benefits embrace: 1) cost reduction, efficiency gains and improved quality of service delivery; 2) transparency and accountability; 3) development of a networked digital community and a true information society; 4) better and efficient decision making on the part of government leaders and 5) citizens' participation through e-democracy (Zaigham, 2011).

According to Ndou (2004), by reducing human errors, cost reductions could be achieved and by streamlining internal processes, efficiency could be improved. In addition, the quality of service delivery could be improved with regard to accessibility, content and wasted time by transactions that were convenient and fast. Bertot et al. (2010) argue that the openness and transparency of government would be enhanced if government website made their legislation, role and standards accessible to citizens, which could increase accountability and reduce corruption.

Ndou (2004) also explained that by sharing information about citizens in the central database, the capacity of government departments would be extended by e-government systems, and Mansell and Wehn (1998) claimed that boundaries of communities were expanded by e-government due to the strong relationship between users, businesses and government. The OECD (2004) suggested that e-government contributed to better decision-making, because citizens could contribute their opinions and ideas. Ndou (2004) also believed that as citizens gained greater familiarity with e-government, the application of ICT would be extended to other areas of their lives.

Misra (2007) proposed a classification for e-government based on groups that would benefit, such as:

- Citizens - this relates to more convenience, faster and more efficient services, reduced costs by not visiting government departments, better transparency and greater accessibility,
- Business - this relates to improved quality, reduction of routine, time savings, better transparency and online financial transactions, and
- Government - this relates to better quality decision-making, reduced costs and time savings.

However, the benefits achieved by e-government were classified by Al-Shehry et al. (2006) as:

- Political - this relates to enabling democracy by online voting processes, enhancing the image of government, establishing trust between government and citizens and encouraging citizens to participate in political decisions with e-participation.
- Economic - this relates to enabling greater interaction between government and industry and business, and reducing costs for government (UN, 2001) and citizens by avoiding the need to visit government offices through offering online services.
- Social - this relates to empowering citizens with better access to online information, improved chances of e-learning and training, meeting the needs of the elderly and those with special needs and delivering a better service.
- Managerial - this relates to faster decision-making, simpler monitoring of tasks, reducing corruption, eliminating human errors and reforming the public sector.

Successful outcomes of e-government when effectively implemented should also include:

- Customer Service by offering services to citizens that are right first time and cost effective,
- Social Inclusion by including everyone in society and using the capacity of e-government to bridge the digital divide, and
- Democracy and Accountability by enabling e-participation in democratic processes and encouraging openness (Office of the Deputy Prime Minister (UK), 2002).

According to Irani et al. (2007) who considered the government prospective in their study, the main benefits of adopting e-government are improving the effectiveness of government services and enhancing efficiency while Zheng et al. (2013) argued that the main e-government benefits are reducing corruption delivering more transparent and accessible public services, promoting e-democracy, and saving costs.

However, some researchers have claimed that benefits from adopting e-government systems differ between developing and developed countries, but other researchers have claimed that there is no difference in benefits for these types of countries, but as developing countries often only adopt limited implementation of e-government, they seldom achieve the benefits gained by developed countries (Ndou, 2004).

The benefits of e-government prolonged the government itself to the business sector as well as the citizens at large which are our target in this study. On the other hand, the extent of the benefits are varied between nations as people don't care much about saving in wealthy countries but looking for more convenience services. Therefore the benefits should be considered by case in order to examine the relative advantage of the service which influences the adoption.

This section has highlighted the benefits and opportunities offered by e-government from the review of the literature, but this findings have also revealed constraints and limitations perceived by these researchers regarding its implementation. Therefore, the next section will examine the obstacles to implementing e-government.

## **E-government constraints**

The previous section categorised the likely benefits of e-government for the public sector, private sector and citizens, but the developmental stages of implementation have been shown to be difficult, with many obstacles and challenges that need to be overcome. According to Heeks (2006), many e-government systems fail due to poor management procedures and ineffective implementation. The failure of e-government is could be assessed as inability of the government to achieved a predefined goal or to gain anticipated benefits in a scheduled time table.

According to Rehman, Esichaikul & Kamal (2012) the failure rate of e-government implementation is even higher in developing countries. In this regards Heeks (2008) claimed that 35% of e-government initiatives have failed, around 50% of these initiatives partly fail by not achieving their main objective and in developing countries only 15% of e-government initiatives were successful. As a result of poor infrastructure and insufficient human and technological resources in developing countries, this result could be predicted. The implementation of e-government systems is subject to a variety of limitations, and the following part of this section will highlight a range of views from the literature.

The OECD (2004) examined how implementing e-government is affected by external barriers, and reported four main reasons that were:



- Regulatory and legislative barriers - these relate to the regulations controlling electronic services, such as the security and privacy of financial transactions and electronic signatures,
- Budgetary barriers - these relate to whether the infrastructure is adequate and if sufficient resources are available,
- Technological change barriers - these relate to how government departments are prepared for a change from a legacy system to a shared infrastructure, and
- Digital divide barriers - these relate to whether all citizens are able to access e-government systems and if there is sufficient software and hardware available for all to use.

According to Ndou (2004), these limitations restrict the opportunities to develop e-government systems, but the central limitation for implementing e-government is often an ICT infrastructure that is poor, as this forms the essential element of the these processes (Medjahed et al., 2003; Wang et al., 2004). According to Akman et al. (2005), legislation and policy issues are significant factors that limit the successful implementation of e-government, because to manage the project, new innovations are required for new roles, such as electronic transactions, freedom of information and data protection.

Several studies have found that security and privacy factors influence the level of e-government adoption, as these determine the degree of trust between the government and the citizens (Fountain, 2003; Lam, 2005; Carter and Belanger, 2005). Therefore, when there is insufficient trust by citizens in Internet services this limits their intentions to use the systems of e-government (Belanger and Carter, 2008), so information security tools need to be an important part of e-government applications, such as digital signature (Peiris et al., 2008).

In developing countries, there is often a lack of skilled personnel, as new projects need government staff that are sufficiently qualified and skilled to use the new technology.

These findings were supported by Goings et al. (2003), who claimed that insufficient staffing and funding were significant challenges that limited the implementation of e-government, as well as maintenance and willingness to use the technology. Moon (2002) added insufficient technical support as a negative factor to the barriers already highlighted. Governments also face the limitations presented by the digital divide in enabling all

citizens to access online services, as well as to ensure that all citizens acquire relevant computer and Internet skills (Lam and Lee, 2005). Van Dijk et al. (2008) argue that the digital divide can be represented by the differing levels of accessibility between rural and urban areas, as well as differing levels of skills or computer literacy.

Zaigham (2011) supported this prospective when he identified barriers to develop e-government projects in developing countries and argued that difficulties are due to the fact that e-government is a huge undertaking and there are numerous inherent issues and barriers to successful development and implementation which include: 1) lack of clear vision and commitment from political leadership; 2) inappropriate assessment of eReadiness of the nation; 3) lack of ICT infrastructure and provision; 4) unavailability of ICT equipment and citizens' limited access to such technology and 5) citizens' inability to make full use of ICT usually due to lack of e-literacy and the digital divide that normally exist in most developing countries.

According to Heeks (2006), many government departments face significant challenges in changing from a central style of management to one that is decentralised, so change is needed to hierarchical styles of management, as well as a change of culture. This raises the limitations of implementing e-government from government employees who are resistant to change, particularly changing from paper-based administration to online services (West, 2002; Ndou, 2004). In contrast to these findings, other researchers have suggested involving employees at the earliest stages of implementing e-government to overcome their resistance to changes in work practices (Altameem et al., 2006; Al-Karaghoul et al., 2005). Another obstacle facing the implementation is the necessity to have collaboration and partnership at various levels among the private and public sectors and within the public sector itself to build transparent network among the stakeholders (Ndou, 2004).

In addition, to overcome the need for further changes at an advanced level of e-government implementation, one significant challenge is to ensure that the implementation strategy is appropriately tailored to the needs of users and government, as well as ensuring a clear vision has been created (Ndou, 2004; Al-Shoaibi, 2008). However, there are significant challenges when planning a strategy that is dynamic and analytical with achievable targets, as handling current and past data, as well as predicting how this may vary in the future is time consuming. The successful implementation of e-government also relies on effective leadership, so that leaders of this project should be able to support,

influence, involve and motivate others to overcome the negative perceptions that the project would be expensive, risky, complex and novel (Ndou, 2004).

According to Heeks (2006), ineffective management is a significant barrier preventing successful implementation of e-government, and the author argued that the limitations included insufficient money and time to support the structure and systems of management, as well as gaps between the project's planning and the reality of staffing, skills, objectives, processes, technology and data designs. These gaps between assumptions and reality were defined by Heeks (2003) as forming three elements:

- Hard-soft gaps - these relate to the digital divide or insufficient awareness of the citizens and the technology available,
- Private-public gaps - these relate to assumptions regarding the needs of public and private sectors, and
- Country context gaps - these relate to a mismatch of the needs of governments and the needs of citizens.

Other researchers have focused on how implementation of e-government has been limited by organisational barriers, such as security factors, privacy, insufficient support of top management and resistance to change (West, 2004; World Bank, 2003). These challenges were defined by DeBenedictis et al. (2002) and matched to the perceived risks for government and citizens in the next table 2.1.

Challenges	Risk to government	Risk to citizens
Privacy	Reduces confidence and trust in government.	The freedom of citizens is encroached.
Security	Reduces confidence and trust in government. Data can be lost or misused.	Data can be lost or misused.
Technical elements	Infrastructure is insufficient. Technology is out-of-date. Scalability is poor.	Insufficient access. Inability to use the technology. ICT literacy skills are insufficient.
Competition	Tasks are duplicated. Conflicts of territories. Conflicts of interest.	Inability to compete.
Empowerment	Control is lost. Greater response required.	Too much information.
Accessibility	The digital divide is stretched.	Citizens are disenfranchised by lack of access.

Table 2.1: Significant Challenges of E-Government. Source - DeBenedictis et al. (2002)

The literature emerges different barriers facing the implementation of e-government from clear vision to adequate infrastructure, technical challenge, legislation, Shortage of financial resources, trust and digital divide. However, in our case of study and particularly among developing countries, the digital divide and trust are more crucial factors impede the citizen's adoption of e-government towards success implementation of the system.

The previous sections have discussed obstacles and challenges that need to be overcome to implement e-government, and so the following section will examine what factors could influence its successful implementation, and researchers have revealed varied findings that relate to human, management and technical factors.

### Success factors for e-government implementation

The review of the literature has revealed that most findings have focused on the weaknesses and failure of e-government systems, but some studies have identified factors that enable opportunities to exploit these systems and overcome its barriers and problems (Al-Azri et al., 2010). The three success factors suggested by Altameem et al. (2006) were organisational, technical and user factors. Organisational factors related to sufficient funding, effective leadership, support of top management, the change of culture needed when moving from traditional to electronic transactions, clear vision and effective planning. Technical factors related to whether the ICT had an infrastructure that was flexible, secure, accessible and useable. Finally, user factors related to the provision of training needed to raise levels of computer literacy and to enhance awareness of the project.

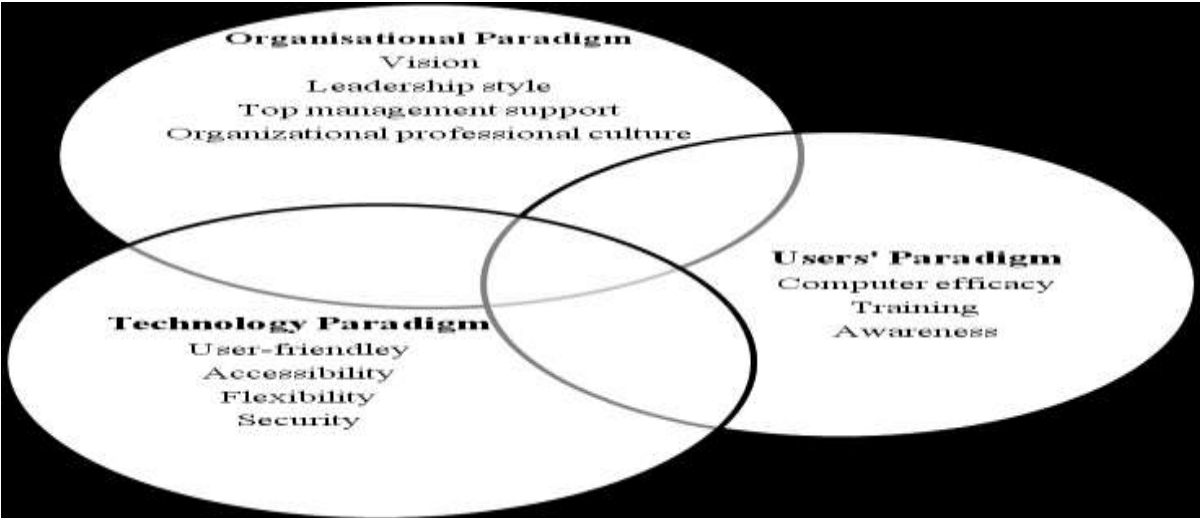


Figure 2.4: Success factors for implementing e-government. Source; Al-Azri et al. (2010).

Figure 2.4 illustrated the main three factors for successful implementation of e-government project which include organisational paradigm, technology paradigm and users 'paradigm by Al-Azri et al. (2010). This study reviewed the literature and synthesis the key success factors for e-government implementation. However, this investigation uses a single case study and data was mainly collected by means of semi-structured interviews and organisational documents from the Ministry of Higher Education in Oman.

On the other hand, Ziemba et al (2013) classified the key success factors for e-government implementation into four categories which are economic, socio-cultural, technological and organizational. All the factors are considered in three stages: (1) ICTs access – reflecting technical and economic accessibilities of ICTs, (2) ICTs competences – reflecting competences and awareness related to the use of ICTs, (3) ICTs use – reflecting actual usage of ICTs. The research findings showed that economic, socio-cultural, technological and organizational factors (e.g. national wealth, human capital, ICT infrastructure, rule of law, organizational changes, leaderships support) matter in accelerating country's ability and willingness to implement e-government successfully.

Irani et al. (2006) argued that it was important to establish what would be required from the infrastructure and to set targets for training to overcome limitation in subsequent stages, and supported the importance of the roadmap and planning processes. Different findings were presented by DeLone and McLean (2003), who argued that the successful implementation of an information system is determined by the users' intentions to adopt and satisfaction achieved that, was based on the quality of the service, the quality of the system and the quality of the information.

Wood-Harper et al. (2004) proposed success factors for e-government adoption as including:

- People - and how their skills, knowledge and awareness were increased,
- Processes - and how these demonstrated transparency and trust, and
- Systems - and how these need to be accessible, secure and reliable.

Al-Fakhiri et al. (2008) placed greater emphasis on social, cultural and human factors for their findings of the successful implementation of e-government by providing Internet access in public libraries to widen its availability and to begin to bridge the digital divide, as well as involving citizens during the early stages of implementation through workshops and information meetings. This study also made recommendations that to make

government websites more effective they should use clear language, enable easy navigation, and that training courses should be made available for citizens.

Other research findings also highlighted the importance of non-technical factors, such as economic, management and human elements to implement e-government successfully (Al-Mashet, 2005); however, Abanumy and Mayhew (2007) argued that the number of users who adopted e-government systems was determined by whether government websites were easy to navigate, accessible and useable, as well as the quality of information provided. Organisational factors were studied by Hussien et al. (2007), which included resource allocation, goal alignment, decision-making structures, IT management knowledge, management style and support from top management, and how these correlated to information and system quality in information systems. These findings revealed that the best predictor of success from these organisational factors were goal alignment, then managerial style and then decision-making structures. Other research into organisational factors influencing the success of e-government was undertaken by Chen (2010) who studied what was needed to achieve citizen-centred e-government, and found the success factors were commitment to citizen services, technical capacity and management capacity.

In contrast, Heeks (2003) studied the gap between design and reality for management aspects and management roles, so that by identifying this gap, the risk of failure could be decreased. The findings suggested seven approaches to analyse e-government systems that were:

- Information,
- Technology,
- Process,
- Objective and value,
- Staffing and skill,
- Management systems and structures, and
- Resources, such as money and time.

This study examined each of these approaches by determining the gap exposed between the design planning and reality, and then suggested action to reduce the gap by changing the design or the current reality. Heeks (2003) argued that the risk of e-government failure could be reduced if the generic gap or dimension specific gap could be reduced.

Ndou (2004) made recommendations that included beginning with a realistic pilot project and linking some contents and to develop slowly to overcome barriers, then to prepare a second plan with tools that are re-engineered to achieve action that is fast and flexible. Other recommendations were to prepare for culture change, invest in developing citizens' potential, raising awareness and assess e-readiness. In contrast, Fraga (2002) recommended a comprehensive approach to e-government implementation so that e-governance systems would be interoperable, re-engineered to enable redesign and revaluation, private, secure, accessible, easy to use, transparent and include all government applications.

Guidelines were presented from the findings of Bhatnagar (2004) based on practical case studies of successful e-government implementation, and these included being prepared for slow ramp up, strong management, effective leadership, capacity to manage change, re-engineering processes, avoid innovating existing processes, extending automation, creating service delivery that is citizen-based, starting small and clearly defining the scope of the project.

According to Park (2008), the success of e-government is determined by citizens' perception of its value, and attempted to measure this through social awareness, services to citizens, efficiency, time savings achieved due to access to quality services and information and ease of access. Overall, the success of implementing e-government has been suggested by many researchers as emphasising the factors relating to citizens, humans and users.

Therefore, this study will focus on how citizens are a significant factor that influences the adoption of e-government. The following section will discuss the adoption of e-government, and the perspective of users will be the focus to identify the relevant factors.

## **E-Government Implementation and Adoption**

Adoption in IT refers to the organizational decision to make use of IT systems to support the organization's functions, decision-making, and management of the business (Thong & Yap, 1995). Though Warkentin et al. (2002) defined the process of e-government's adoption as citizens' intention to engage with the government to ask for services or find information, but unless the needs and expectations of citizens are effectively targeted to encourage their intention to use government websites. King and Cotterill (2007) cite a speech regarding transformational government by the UK Prime Minister in November 2005, which explained that technology would give citizens better choice in public services in the future, as these services should be determined by the needs of citizens, but not the needs of government. This view was shared in a report by the United Nations cited by Chen (2010) that e-government systems should aspire to enhance the relationship between government and citizens through Internet facilities that create citizen-based government and governance as an example of ideal e-government systems.

According to Heeks (2006), 80% of the world's populations live in developing countries, but these reflect only 20% of users of e-government. However, Teerling and Pieterse (2010) found that citizens in developing countries demonstrated a greater preference for face-to-face interaction with government departments than compared with citizens in developed countries. Bertot and Jaeger (2008) and Van Dijk et al. (2008) claim this low percentage of users in developing countries is due to limited electronic services available for adopting and use. Most governments across the world encourage citizens to use e-government systems as they are more cost effective, and according to Ebberts et al. (2008), Canada is a leading country in e-government adoption, and report that as a result of greater use of electronic services, the country has achieved a twenty-fold reduction in costs. These findings are supported by the UK Efficiency and Reform Group that planned to save £3.2 billion each year by using e-government systems (epractice.eu, 2010).

Teerling and Pieterse (2010) studied why citizens remained loyal to traditional methods of government interaction, and found that citizens' choice was influenced by their expectations and needs, as well as the suitability of the type of service and the characteristics of the media. Also, the findings revealed that citizens may be influenced negatively or positively to adopt new technology by factors such as emotion, habit and



ease of use. Recommendations for evaluating e-government systems suggested by Griffin and Halpin (2005) included assessment of development stages, estimation of value of Internet electronic services, evaluation of revenue and costs of the project and the involvement of the stakeholders.

Most research into e-government systems was claimed by Titah and Barki (2006) to have focused on the sub-culture of government, evaluation of e-government, technology aspects, organisational characteristics, individual characteristics and management practice. However, other researchers have claimed that there has been a greater focus on the supply side factors of public services (Verdegem and Verleye, 2009) where existing government services are transformed to electronic versions (Van Dijk et al., 2008). Researchers have also found that many governments across the world have placed a greater focus on the possibilities of technology in their designs for e-government systems, and have failed to consider the expectations of users or the needs of citizens (Verdegem and Verley, 2009; Van Dijk et al., 2008; Bertot and Jaeger, 2008). This is revealed by the studies of organisational factors and their influence on e-government success, such as clear vision, cultural change, leadership style, financial restrictions and support of top management (Ebrahim and Irani, 2005; Lam, 2005; Moon and Noris, 2005; Al-Shehry et al., 2006; Titah and Barki, 2006; Altameem et al., 2006; Eynon and Margetts, 2007; Welch and Pandey, 2007; Tseng et al., 2008). In contrast many researchers have concentrated on studying technical factors, such as flexibility, quality, security, accessibility and usability (Wilson et al., 2002; Wood-Harber et al., 2004; Abanumy and Mayhew, 2007; Gebauer and Lee, 2007).

Other research studies have examined human factors and demand for services as important influences when introducing an information system, and the importance of users in their role in adapting to new systems (Al-Mushayt et al., 2001; Cabrera et al., 2001; Doherty et al., 2003). The website for [egov.infodev.org](http://egov.infodev.org) suggests that where e-government is successful, this relates to 20% of responsibility due to technology and 80% of responsibility due to organisations, processes and people. In addition, the willingness of citizens to use the system can be used as a measurement of its successful implementation (Evans and Yen, 2006; Shareef et al., 2009). Consequently, the evaluation of e-government projects success could be measured by comparing the number of e-services deployed by the government with the adoption rate or the number of users of these services.

According to Al-Azri et al. (2010), adopting e-government is not a straightforward task, as it involves human, technical and management factors that contribute to other processes, such as computer literacy, training and user awareness. The adoption of e-government has been widely studied from the perspectives of management and technical factors; however, more research is needed to examine the human factors, particularly the psychological, cultural and social elements of users in developing countries, as citizens lives are more influenced by social activities and culture than in developed countries (Al-Mashet, 2005; Al-Shehry et al., 2006; Al-Fakhri et al., 2008).

Al-Shafi, and Weerakkody (2010) studied factors affecting e-government implementation and adoption in the State of Qatar. They build a model which contains organisational, technical, political and social influences based on the institutional theory.

- The organisational theme includes power distribution which refers to the shifting of authority and loosing of power to facilitate e-government system. Moreover, the organisational theme considered information systems strategy, prioritisation of deliverables, future needs of the organisation, changes in organisation culture and the needs of training.
- Additionally, the technical theme which influences the implementation includes standardise the technology, considering security and privacy issues, system integration and e-government portal and access.
- Furthermore, the political theme is considered by availability of top management support, availability of fund, professional leadership and legislation and legal which refers to the change on the regulation to cope with new innovation.
- Finally, the social theme which embraces citizen-centric focus which refers to focus on the citizens needs and tailor the services to their values. Other, social factors are the awareness of the system and the digital divides which refers to the extent of the accessibility and the level of knowledge and skills of the system among the citizens.

Al-Shafi, and Weerakkody (2010) claimed that among these implementation themes, the success of e-government project implementation is highly predicted by the citizen's perspective and their behaviour towards the adoption of e-government.

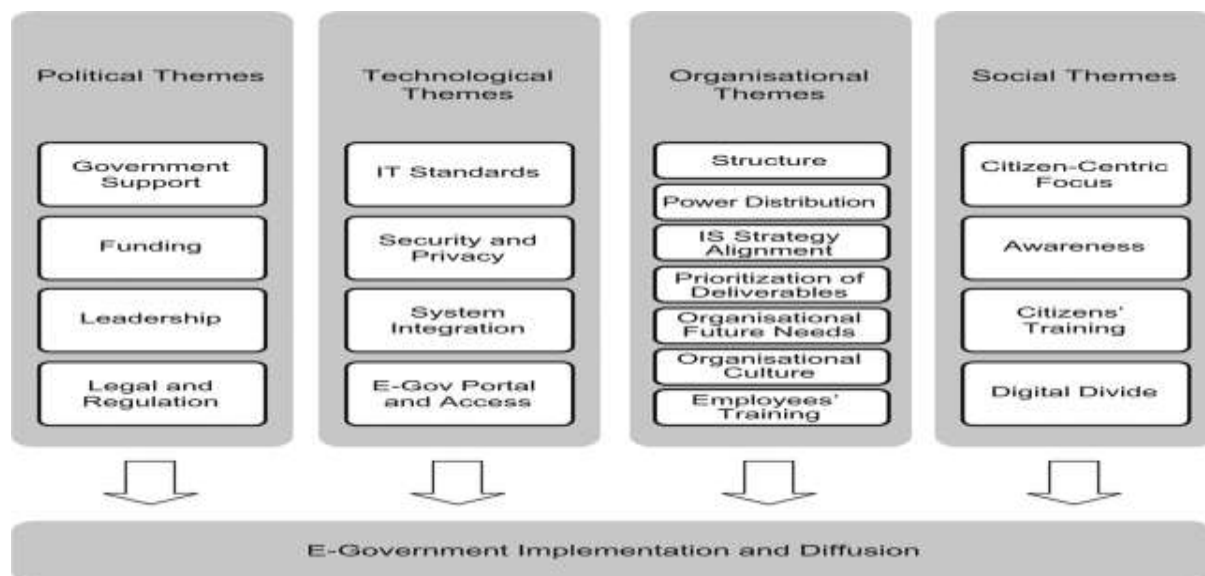


Figure 2.5: E-government Implementation Themes. Source Al-Shafi, and Weerakkody (2010).

According to Patel and Jacobson (2008), the adoption of e-government systems is significantly affected by culture, and the website of bridges.org (2001) explains that to determine a nation's e-readiness for the future, part of a government's national ICT policy should consider the region's historical environment and culture.

Kovačić (2005) argues that the readiness for e-government across the world is directly affected by national culture, so e-government systems cannot be purchased and adopted as an off-the-shelf package, and no model has been proposed that will ensure e-government can be adopted successfully (Al-Shehry et al., 2006).

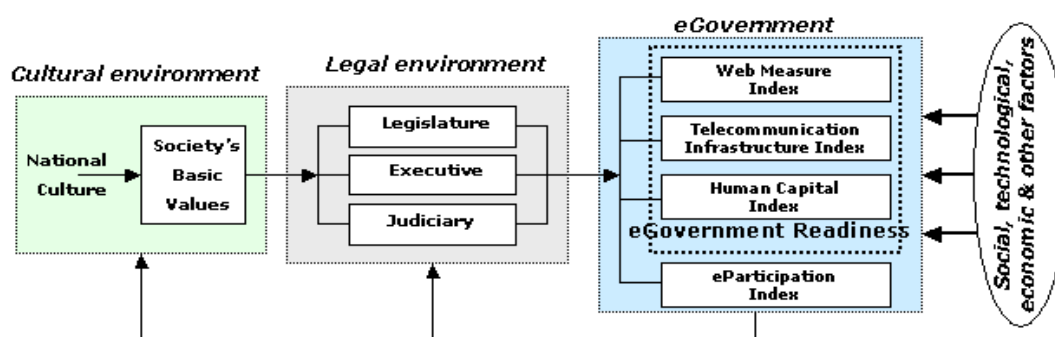


Figure 2.6: Model of national culture impact on the government readiness. Source - Kovačić (2005)

Therefore, this study will examine user factors that have an influence on e-government adoption, and particularly the influence of culture that might limit this adoption in developing countries. This research will examine the society of Saudi Arabia, as tradition, culture and religion affect all aspects of life for these citizens (Al Turki, 2002).

However, this review of literature has also revealed that some developed countries with an effective ICT infrastructure, stable economies, and suitable technology and organisation remain at the early stages of e-government adoption with insufficient involvement of citizens. As a result, the theoretical background revealed in the literature will be discussed in the next chapter, and this will examine the factors affecting the intentions of citizens to use e-government. These factors will also identify how culture and social activity can affect users' intentions to use e-government in Saudi Arabia, and this study aims to establish a model for citizens' intentions to use technology in Saudi Arabia and countries with similar cultures containing critical factors.

## **Conclusion**

This chapter has attempted to present a review of e-government from the literature on the subject, since it began to be evolved during the 1990s, and how the development of e-commerce has exerted pressure on the public sector to use this technology for government departments. E-commerce and e-government has been compared, and findings from the research have been used to clarify possible confusion between information systems and e-government projects in the public sector. This chapter has also examined the varied definitions of e-government, and clarified e-governance as power, and electronic services determined by e-government. The categories of e-government were then explained that broadly covered the processes of e-government as government to government (G2G), government to business (G2B), government to employee (G2E) and government to citizens (G2C).

The life cycle of the e-government system was considered as the stages of publishing, interacting, transacting and transforming. The benefits made possible by e-government were explained as including better access to services from any location and at any time, improved transparency, reduced corruption, improvements to accuracy and quality of operations, better effectiveness and efficiency of the service, as well as savings in time and costs.

These benefits were balanced by challenges and constraints that were exposed by the literature, such as the digital divide, legislation and regulation barriers, insufficient trust, resistance to change, insufficient funding and poor infrastructure.

This chapter then highlighted the factors that contributed to the successful implementation of e-government based on users, organisation and technology. Professional culture, leadership style, support of top management and clear vision were organisational factors, and security, flexibility, usability and accessibility were technical factors. Training needs, sufficient skills and better awareness were the user factors. The chapter concluded by highlighting the factors from the literature that influenced the adoption of e-government with a focus on human factors, particularly the cultural differences between countries and how this has an impact on adoption. In the next chapter there will be a focus on factors that influence the intention of users to use this new technology by studying the theoretical background.

# Chapter 3:

## The Kingdom of Saudi Arabia:Background

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### **Introduction**

The review of literature in the previous chapter presented a general overview of e-government, but this chapter will examine the specific characteristics of Saudi Arabia, and how the country has implemented these systems as a developing country. Across the world, e-government has been adopted by many governments to reduce costs by improving accessibility, speed, quality, effectiveness and efficiency of their services. Despite this widespread adoption of e-government by many countries across the world, no off-the-shelf system or universal model is available, so e-government is generally implemented by a country that relates to its cultural, social, political and economic characteristics. However, these elements of a country's characteristics could impede the adoption and implementation of e-government processes, rather than foster them.

Therefore, this chapter will present the case study of the Kingdom of Saudi Arabia with concise information relating to the importance of religion, as well as the type of regime present in the country. Information about the characteristics of the country will include cultural, economic, climate, demographic and location information that would be likely to prevent or promote the successful implementation and adoption of e-government.

Emphasis will also be given to the country's national technology plan, ICT statistics indicators and ICT development, and the programmes for e-government and e-commerce will also be examined within the national technology plan. Factors that are likely to obstruct or promote the implementation of e-government, as well as e-commerce, in Saudi Arabia will also be discussed. As Yesser was adopted by Saudi Arabia to implement systems of e-government, the chapter will also examine how this facilitator programme has been used, and other initiative projects relating to the implementation of e-government in the country. The chapter will conclude with an investigation of assessments carried out by the UN and the Gartner Group into the e-government program adopted by Saudi Arabia, as well as other relevant research into the adoption of technology in the country.

## **Saudi Arabia: Characteristics**

The most important characteristics that define Saudi Arabia are the holy shrines at Medina and Makkah, and its significance as the birthplace of Islam, which contribute to around two million Muslim pilgrims visiting the country each year, as well as times of prayer for Muslims across the world when they turn towards the country's location five times each day, which forms part of their duties for the Islamic faith, or two of the five pillars. In 1932, King Abdulaziz bin Abdurahman Al-Saud founded the country of Saudi Arabia, and ensured the constitution was governed by Islamic law with the Koran and Alsharia law as central elements.

The country has maintained a monarchy as its regime, which has been inherited by the sons of King Abdulaziz, and the current monarch is King Abdallah bin Abd Al-Aziz Al Saud, who became king and prime minister of the government in August 2005, and he is succeeded by his Heir Apparent, Crown Prince Salman bin Abd Al-Aziz Al Saud. However, the king of Saudi Arabia is officially known as the custodian of the two holy mosques (The World Fact Book, 2010). According to Al Saggaf (2004), the religious importance of Saudi Arabia strongly influences its culture and society, and has a direct impact on all elements of life for its citizens. To represent its significance as the heart of Islamic countries, the country promotes this image to Islamic countries across the world as unique and stable, which contributes to a culture within its society that demonstrates high uncertainty avoidance, and is extremely resistant to change overall.

However, the country's importance as the centre of Islam requires its government agencies to maintain effective control of accommodation, health services and transport to meet the needs of large numbers of visitors who arrive at the same location at the same time each year. These logistical issues formed the initial justification for the e-government program to be implemented, so that various government departments could coordinate their services during the season of pilgrimage into a central database.

## **Saudi Arabia: Location**

In the southwest of the continent of Asia, the Kingdom of Saudi Arabia (KSA) covers over two thirds of the Arabian Peninsula, and forms the largest country with an area of 868,730 square miles, which is about 2,150,000 square kilometres (The World Fact Book, 2010). Saudi Arabia has a landscape that includes plateaus, mountains, plains, valleys and deserts, and has an eastern coast along the Arabian Gulf of around 560 kilometres, and a western

coast along the Red Sea of around 1700 kilometres (Saudi-network). The topography of Saudi Arabia could be defined in four main regions, including the Najd plateaus in the central region, the Tehama plains in the southwest region, the mountains in the north region, and the desert in the Empty Quarter (Saudi-network). This variety of topography is very large and includes, urban, rural and desert areas, and presents challenges in implementing e-government programs in order to simplify its departments' processes and communication, as well as ensuring government agencies have access to integrated data.



**Figure 3.1: Map of Saudi Arabia, source: Worldatlas.com**

Saudi Arabia has borders with Kuwait, Iraq and Jordan in the north, Oman and Yemen in the south, Qatar, Bahrain and the Emirates in the east, and the Red Sea to the west. Al-Farsy (2003) explains that the culture of the country has been diversified by its location that offers effective links between the continents of Asia, Europe and Africa, and important links between western and eastern countries. Riyadh is the capital city with a large population in the central region, although most pilgrims visiting the holy cities arrive in Jeddah, which is also the main port and important commercial city in the western region. The main port on the Arabian Gulf is Dammam in the eastern region where the oil is explored and exported.

**Saudi Arabia: Demographic information**

The Saudi Arabian Central Department of Statistics and Information report the population of the country in 2010 to be 27, 136, 977, which represents around 18.7 million Saudi citizens (68.9%) and around 8.5 million non-Saudis. The gender balance is shown to be around equal with 50.9% male and 49.1% female, but this data also reveals that the Saudi population has a high percentage of young people (29.4% under 14 years of age) and with only 3% of the population over the age of 65 years, most of the population is between 15-



64 years (The World Fact Book, 2011). This high percentage of young people reveals that 25 years is the median age of the population, which is similar for males and females (26 male and 24 female). As a consequence of this high percentage of young people, there is a greater likelihood that the transformation of Saudi Arabia into an information society will be supported, as younger people have a greater capacity to acquire new skills and accept new technology, when compared to older groups of the population. Research findings have confirmed that young adults with higher income and higher education qualifications are more likely to use e-government services (Hart-Teeter, 2003; Shelley et al., 2004).

### **Saudi Arabia: Climate**

The World Fact Book (2011) describes the climate of Saudi Arabia as mild during the winter, but for around 8 months a year to be desert-like and dry, harsh and with very high daytime temperatures of around 50°C. However, this climate could be identified as a factor that could motivate the adoption of e-government, because citizens could be encouraged to use e-government services rather than visiting government offices during the hottest parts of the day. Most of the population of the country lives in urban areas (82%), which is also considered to be strong motivation factor for adopting e-government services (The World Fact Book, 2010), as there is greater access to Internet services in urban areas when compared to rural areas, and reveals the country's digital divide. The average literacy rate in Saudi Arabia is 78.8%, with a higher rate for males (84.7%) and lowers for females (70.8%) (The World Fact Book, 2003), which is also likely to contribute to support and adoption of e-government services, and make an easier transition into an information society.

### **Saudi Arabia: Economy**

The Saudi Riyal is the currency of the country, which mostly relies on income from oil for its economy that forms 90% of export earnings, 45% of GDP and 80% of budget revenues. The country is ranked as the largest exporter and producer of oil across the world, and currently holds around 20% of oil reserves in the world (The World Fact Book, 2010). Further development of the petrochemical industry has increased revenue for the country with oil related commodities, such as natural gas, metal, copper and iron. Most industrial activities are controlled by the public sector, but the private sector has been encouraged by the government to invest in the country, so that capacity for employment could be increased, and revenue resources diversified. In 2010, the Saudi unemployment rate was 10.8% (The World Fact Book, 2010).

Saudi Arabia has used its strong economy to invest in its basic services, education and infrastructure, which should also contribute to the implementation and adoption of e-government services by supporting the project with new innovations introduced by consultants from across the world who offer specific expertise, appropriate training for computer skills, and an infrastructure that is adequate to support the adoption of software, hardware and an Internet network. This investment by the country has revealed its e-government readiness ranked by the UN in 2005 at 80, reduced in 2008 to 70, and then in 2010 was ranked at 58, but in 2012 was ranked at 41 (UN, 2005, 2008, 2010, 2012).

### **Saudi Arabia: Culture**

Tribal systems, adherence to religion and modernisation have defined the culture of Saudi Arabia, and the community practices, privileges, obligations, patterns, traditions and social norms are determined by Islam. Al Saggaf (2004) explains that Islam is a system that affects Muslims in their way of life, as well as their law and theology, so that this is not only a religious ideology. When Islam applies ideal principles, Muslims are encouraged by the religion to select the best options for improving their lives, following rules and respecting others, which results in the society developing better. Although Islam motivates gender segregation in specific cases for a safety and privacy concerns, a conservative group promoted the separation of gender as a role which developed as traditions, pattern and norm of the Saudi society through the years. Therefore, the culture of Saudi Arabia determines that the genders are segregated, so that men and women work separately, and in applications to government offices and departments, women are highly dependent on men. Women are also unable to drive within the country, and have to rely on male relatives for their transportation, which suggests that women would be encouraged to adopt e-government services rather than to visit government offices or departments as they could carry out these activities using the Internet within their home. Saudi culture often demonstrates nepotism and bias, which are due to the country's tribal systems and kinship, so that e-government systems are perceived as a way to reduce corruption within the public sector, and ensure justice is applied fairly across all members of society. Al Saggaf (2004) conducted a study to measure how people are influenced by online activities in Saudi Arabia and found that people became open minded, self-confident, more aware of personal characteristics and less inhibited about opposite gender.

The Saudi government has identified a priority of employing expert consultants from developed countries to help support its efforts in transforming and modernising the country (AL-Shehry et al., 2006); however, the adoption of western technology could expose concerns from this religious, tribal and conservative society. According to Al Saggaf (2004), these concerns were revealed when the Internet was first introduced into Saudi Arabia, as concern was expressed in the society about undesirable content and material, such as pornography, that was being introduced into people's homes. Following widespread discussion and consultation within the country, the government resolved the concerns by establishing in the city of Riyadh an Internet filter, which was managed by King Abdul-Aziz City of Science and Technology, which was used to control the content of websites on the Internet that could be accessed within the country.

These findings have shown that religion, traditions and culture of the society need to be considered by the government before e-government systems are first introduced, so that foreign expertise and western technology could be better aligned to the culture of the country, which would make successful implementation and high adoption rates by citizens more likely.

Therefore, the motivations for Saudi Arabia to implement e-government systems include:

- A strong economy,
- A free market with low taxes to attract ICT investment,
- A high percentage of young people in its population that are likely to support the concept of a change to an information society, and show less resistance to change,
- The King and senior government representatives support the concept of e-government,
- Synthesising all government data should reduce costs and improve accessibility for citizens,
- Women have better access to e-government services from their home,
- Corruption and nepotism decreased from reforming government sectors,
- Expectations of citizens met,
- Stimulating other Gulf countries to adopt e-government services, and
- Promoting a positive image of Saudi Arabia as the Islamic centre by coordinating the work of government departments so that the needs of pilgrims are fully met, such as health services, transport, accommodation and safety (Al-Shehry et al., 2006).

In contrast, implementation and adoption of e-government services could be hindered by various obstacles, as Saudi Arabia faces cultural and organisational barriers, as well as technical challenges, which are described below.

The dissemination of e-government services could be impeded by various technical factors, such as: re-engineering processes, accountability, a reliable network, e-services that are secure and safe, modern and unified infrastructure that is lacking over a large area, and lack of trust. Al-Nuaim's (2011) evaluated twenty one websites belonging to Saudi ministries from citizens prospective. He found that eight out of twenty one websites did not implement the main features of e-government system. Additionally, he found that ten ministries were partially or completely in the first stage of the implementation (web presence), three ministries were at the second stage (one-way interaction) and finally six ministries had no online services at all.

E-government implementation in the country could also be hampered by organisational factors, such as judiciary requirements, inadequate e-services regulations, lack of partnership and cooperation between government agencies and with the private sector, lack of IT professionals and government employees and citizens who lack technology skills, and insufficient awareness of e-government services by government employees and citizens. Although that some literature hints that Saudi citizens are somewhat reluctant to deal with their government directly, the culture of the society prefer face to face interaction despite their satisfaction or not of the government services.

Research findings have shown that a universal model for introducing e-government does not exist, so governments need to avoid resistance to new technology and avoid a clash of cultures by tailoring a system that pays due consideration to religious, traditional, social and cultural aspects of society, but Saudi Arabia appears to be demonstrating issues relating to social and cultural barriers (Al-Shehry et al., 2006; Al-Fakhri et al., 2008; Al-Shoaibi, 2008; Alshehri and Drew, 2010). Therefore, the culture of Saudi Arabia needs to be considered to identify what factors are affecting the introduction of e-government to ameliorate these barriers.

## **The Kingdom of Saudi Arabia: The ICT Sector**

The critical role of information and communication technology (ICT) on transforming the society and economy overall has been recognised by the Saudi government, which has led to an investment into ICT of around 27 billion SR (around 7.2 billion dollars) in 2010 and by 2015 could reach 46.3 billion SR (12.3 billion dollars), and regarding spending on ICT would make this the fastest growing country in the region (CITC, 2010). This investment in ICT has included aspects such as smart cities, transportation, education and healthcare with IT services, hardware and software. However, this issue is complex and involves cultural, skills, political and social aspects, and is not only a technical or financial problem (Al-Sudairy, 1994).

Information and communication technology began to be introduced into the country during the late 1990s when the Internet became first available, and subsequently the Ministry of Communication and Information Technology was established by the government to control ICT processes and manage the diffusion of IT across the country (Abanumy and Mayhew, 2005). This Ministry launched various initiative projects to increase the awareness of citizens about the capabilities of new technology, and with the support of the King, every home in the country was supplied with a computer for a low price, and pupils in schools were taught IT skills to improve computer literacy within society and overcome the digital divide. This Ministry also worked to liberalise the ICT sector and introduced greater competition and increased investment, which contributed towards increased revenue (CITC, 2010). The Ministry of Communication and Information Technology established a long-term vision for the country by increasing productivity by transforming it into a digital economy and information society for all sections of society across the country, so that the information industry would become a significant source of income (MCIT, 2005). The development plan for ICT in Saudi Arabia is illustrated as a timeline in the chart below (1998 to 2005).

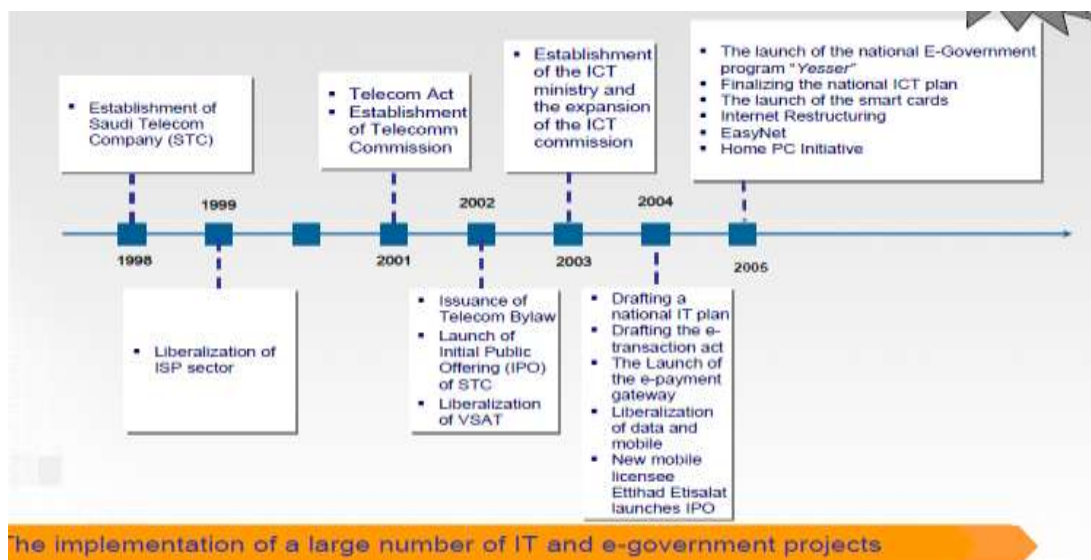


Figure 3.2: Development plan for ICT in Saudi Arabia (AlSabti, 2005).

## National Information Technology Plan

To achieve a number of objectives, a national information technology plan was devised by the government of Saudi Arabia that was intended to create job opportunities for young people within a strong ICT market, which would contribute to supporting the state economy. The objectives included the need to strengthen national security, reduce costs and increase efficiency, so that through e-health, e-commerce, e-government and e-learning would contribute to modernisation of the society, whilst preserving Islamic and Arabic culture in the digital world (Alaboud, 2009). Therefore, the priorities of the national information technology plan are the IT industry, e-health, e-education and e-government.

## Saudi Arabia: ICT Indicators

In 2011, the number of people in the country with a mobile phone subscription reached 54.8 million with 95% penetration, which showed a significant increase since 2001 when penetration was 12%. Fixed broadband subscriptions have also increased in recent years, and in 2011 there were around 2 million subscriptions that reflected 33% of households in the country, which compares with 1.7 million and 27% of households in 2010. In addition, in 2001 there were 1 million Internet users, but in 2011 this had increased to 12.5 million (CITC, 2011). Greater accessibility of citizens to the Internet infrastructure and to computers has been the reason for this increased penetration for a large percentage of the population, but most users of the Internet in Saudi Arabia use the technology for entertainment and to communicate with family and friends.

Internet penetration has also increased within government offices; so that in 2007 this was shown to be 65%, but by 2009 this had increased to 73% and by which time IT training had been completed by 57% of government employees (CITC, 2009). However, according to Gartner (2007), the conservative nature of the society affects the willingness by citizens to adopt new technology. However, the focus on extending the Internet infrastructure in the main cities of Saudi Arabia by the government has resulted in widening the digital divide of other more rural areas of the country. The following figure illustrates how Internet penetration and numbers of Internet users have increased over recent years.

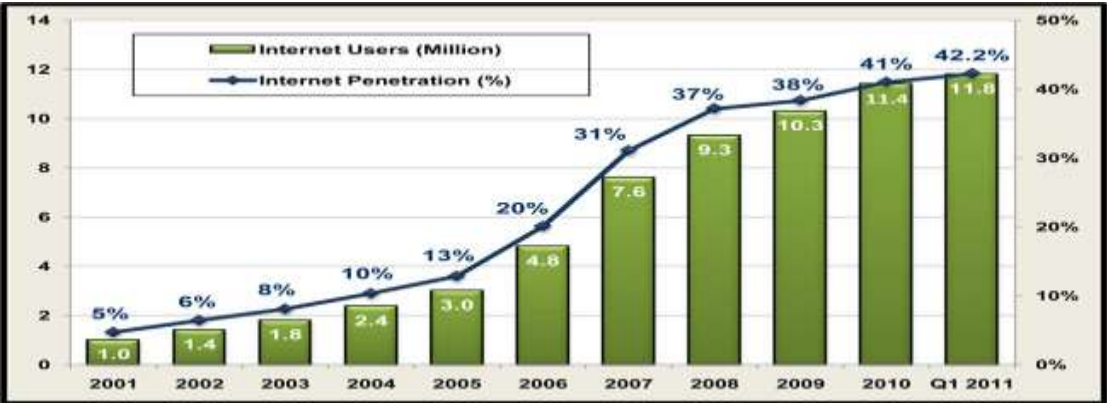


Figure 3.3: The growth of the Internet market in Saudi Arabia - Source (CITC, 2011)

### ICT Statistics

Fixed Telephone Lines (per 100 people.):	16.156
Mobile Cellular Subscribers (per 100 people.):	114.74
Computers (per 100 people.):	13.893
Internet Users (per 100 people.):	25.066
Broadband Internet Subscribers (per 100 people.):	2.4258
International Internet Bandwidth:	750 Mbps
TV Sets (per 100 people.):	26.965
Percent of Population Covered by Mobile Signal:	96%

Table 3.1: ICT Statistics in Saudi Arabia; Source: International Telecommunication Union (ITU)

## **Saudi Arabia: e-commerce**

The government of Saudi Arabia established a standing committee for e-commerce in 1999, which signalled the first steps towards implementing this new technology in the country (MICT, 2004), and the committee included representatives from the Saudi Communication Authority, Saudi Arabian Monetary Agency, Ministry of Information, Ministry of Post, Telegraph and Telephone, Ministry of Finance and National Economy, King Abdul-Aziz City of Science and Technology and Ministry of Commerce (Al-Hoymany, 2002). This committee was mandated to investigate developments in the field of e-commerce and to implement the processes needed to introduce this technology into the country by identifying what was required to develop e-commerce successfully across the country, and to report on the outcomes of the findings at regular periods. A plan of action was devised by the committee in 2001 that identified various specific requirements that included:

### **Telecommunication infrastructure**

The provision of appropriate software and hardware, and to extend the coverage of fast broadband and wireless networks.

### **National Public Key Infrastructure (PKI)**

Ensure appropriate requirements for privacy, confidentiality and safety, such as authentication, non-repudiation and digital certificates with effective security procedures.

### **Electronic Payment System**

Ensure all citizens can access electronic payment systems by creating one central database to handle money requirements by integrating bank transactions.

### **Policies and Regulations**

Create safeguards for users of electronic services through the establishment of legislative and legal frameworks, such as certifying electronic signatures, protecting dealers rights and ensuring commitments are honoured.

Various members of this committee were assigned different roles and responsibilities, so that policy and regulation requirements were examined by the Ministry of Commerce, as well as how to increase awareness of the system. The management of validating digital



signature certificates and key public infrastructure were developed by King Abdulaziz City for Science and Technology, and issues relating to the expansion of the delivery infrastructure across the country were considered by the Ministry of Post, Telegraph and Telephone. The Ministry of the Interior was responsible for defining personal data confidentiality, privacy and security, the development of suitable payment systems for e-commerce was studied by the Saudi Arabian Monetary Agency. Within the context of e-commerce, the Ministry of Information was responsible for considering intellectual property rights, and the main responsibility for supporting e-government services through e-procurement systems was the given to the Ministry of Finance and National Economy (Al-Hoymany, 2002).

Alfuraih (2008) describes delivery systems, payment systems and communication within e-commerce as its three main pillars, but although Saudi Arabia has rapidly improved its infrastructure for ICT in recent years, this new technology was started much later than many other countries. This slower development has resulted in an inefficient delivery service for e-commerce, and much needs to be done to improve the delivery of services and goods to customers by the post office, particularly in reducing delivery times. Although bank transactions are linked on a reciprocal basis and controlled in Saudi Arabia by the Saudi Arabian Monetary Authority (SAMA), credit cards have not been widely used in the country compared to other countries due to religious reasons, such as charges for interest payments. Also, there are two categories involved in e-commerce in the country, which are transportation companies and Saudi trading partners, and large Saudi companies who source products from different international suppliers, as well as local suppliers (Atallah, 2001).

In a study of e-commerce adoption Saudi Arabia, Sait et al. (2004) examined what factors influenced this by using Roger's Theory of Diffusion and Innovations and the Theory of Planned Behaviour, as the first theory has an emphasis on traditional, religious and regional factors. The findings showed that the adoption of e-commerce in Saudi Arabia was influenced by insufficient Internet skills, lack of technological knowledge, as well as concerns about privacy and security. In contrast, in a study of online banking in Saudi Arabia, Al-Somali et al. (2009) used Technology Acceptance Method (TAM) to identify relevant factors and found that computer self-efficacy, social influence, Internet connection quality and awareness of online banking and associated benefits influenced perceived ease of use (PEOU) and perceived usefulness (PU) to accept online banking.

These findings also revealed that the likelihood of adopting online banking was determined by education levels, trust and resistance to change that had a significant impact.

In 2010, 39% of Saudi Arabian Internet users spent about US\$ 3 billion on products from e-commerce services (Arab Advisors Group, 2011), and although a comparison with other Arab countries reveals fast growth in the ICT market in Saudi Arabia, the speed of e-commerce adoption remains slow overall (Al Ghamdi et al., 2011).

Business, technical and cultural issues for Saudis when using e-commerce were studied by Al Ghamdi et al. (2011), who found factors of poor ICT infrastructure, disorganised postcode systems across the country that hinder delivery, lack of competitive advantage normally associated with e-commerce, as well as a lack of support for e-commerce from Saudi people. Other factors that impeded the adoption and implementation of e-commerce included resistance to change, high system set up costs, lack of e-commerce experience, lack of trust for online transactions and lack of legislation systems. Al Ghamdi et al. (2011) recommended that awareness of e-commerce for Saudi citizens could be increased with effective educational programmes, and to offer trial samples of e-commerce to encourage wider acceptance.

## **E-government project in Saudi Arabia**

### **Yesser program**

According to Al Sabti (2005), the transformation of the public sector of Saudi Arabia into the information society has been primarily due to the country's decision to introduce e-government, so that the quality of public services for citizens are improved, the productivity of these services are increased and their efficiency is enhanced, which should contribute to further economic growth. Yesser (Arabic translation of simplify) became an initiative project launched by the Saudi government in 2005 to simplify the implementation of e-government programs into government departments. According to Gartner (2007), in terms of e-government readiness, Bahrain, Jordan and the UAE are ahead of Saudi Arabia due to its late start of introduction, but Saudi Arabia has made substantial progress since that time.

The Communications and Information Technology Commission, Ministry of Communication and Information Technology and Ministry of Finance were responsible for establishing Yesser, and in 2010 the budget for this project had increase to 1.2 billion dollars. The objectives for the Yesser project included bridging the digital divide, spreading information through e-services, transforming the country to an information society, improving productivity and decreasing costs in the public sector and providing better government services that should enhance the quality of life for all citizens, and was not solely a development of information technology (Yesser, 2006).

Two parallel paths formed the strategic plan of this project, where the first path would extend of a maximum period of two years that would include pilot e-government projects and basic requirements for the program with priorities of quick results, high revenue and low implementation costs. The second path would take five years to enable regulations and procedures to be formulated, as e-services increased within other government agencies, so that priorities could be identified (Alaboud, 2007). The strategic vision for the Yesser project between 2005 to 2010 was: (Yesser, 2006; p. 7)

*"By the end of 2010, everyone in the Kingdom will be able to enjoy – from anywhere and at any time – world-class government services offered in a seamless, user-friendly and secure way by utilizing a variety of electronic means."*

The focus for this vision was citizens and those who would use e-government programs, and three objectives were identified, which were contributing to the prosperity of the country, improving the effectiveness and efficiency of government departments and providing better services to users by 2010. These were then divided into a further ten additional objectives illustrated below.



Figure 3.4: Main objectives of Yesser (Yesser.gov.sa).

The goal and the objectives of the Saudi e-government program were broadening to high expectations in a short time which might introduce the disparity between the design and reality. The project neglected the basic requirements from the regulations and legislation issues such as Act of information, copyright and documentation policies. Furthermore, the project should consider the transparency and the culture of data sharing for success implementation.

For any e-government project to be successful, there are various factors that need to be considered, such as the need for a clear vision and strategic objective, as well as ensuring the user is at the centre of the process and that services for users become better, rather than focusing on reducing costs and increasing revenue. The effectiveness and efficiency of government agencies require significant cross-departmental applications, and that previous components of government systems will require an adequate and reliable infrastructure. Also, the procedures of re-engineering, planning and founding processes need to be managed by a dedicated organisation (Yesser, 2006). The e-government framework in Saudi Arabia is illustrated below.



Figure 3.5: Components of e-government (Yesser.gov.sa).

The Yesser project was assessed by the Gartner Group in 2007, which measured levels of complexity and costs as one axis, and the time consumption of technology, process, people and strategy components on the other axis. The findings showed that for the Gartner framework, the clear vision and detailed plan strategy of the Saudi e-government program was placed at advanced level III. However, the findings relating to people skills for implementing this project was placed at level II, and also at this level were process components for re-engineering or redesigning processes. Therefore, the Yesser project was placed at level II overall despite the large investment on technology infrastructure, due to the early stages of the integration environment (Gartner, 2007).

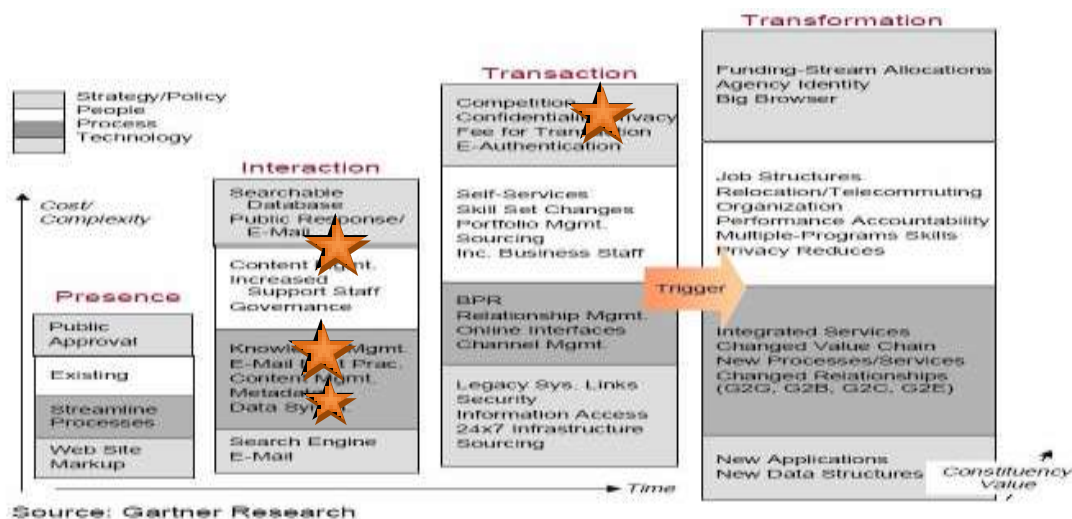


Figure 3.6: Saudi Arabia: e-government stages (Gartner Group, 2007).

The findings of Gartner (2007) showed that soft issues presented most of the challenges that needed to be addressed for implementation processes, such as general interaction, accountability, control and least effective technology challenge and process.



Figure 3.7: e-government implementation: challenges (Gartner group, 2007)

Obstacles that were impeding the successful development of the Yesser project included the lack of awareness and preparedness of the conservative population, controlled access for the Internet, e-legislation and a regulatory environment, lack of sharing data culture between Gulf countries, lack of metrics/accountability culture, need to redesign manual transactions, shortage of skilled human resource, insufficient investment in the ICT sector and uncontrolled spread of information resource between government agencies (Gartner, 2007). Recently, Yesser carried out a survey that measured various indicators of citizen's preparedness for using e-government services, such as usage (58%) and satisfaction (55%) that remain at a low level, but trust reached a high level score (92%) and awareness of the program reached a high level score (82%) (Yesser, 2011).

Due to the support of King Abdullah, a clear plan and strategy for Yesser and high investment in the ICT sector, the project is likely to overcome obstacles in time.

Workshops were organised after the five-year period of the project, so that private sector representatives, consultants, experts and stakeholders could engage in review and discussion to create the second action plan for 2011 to 2014. This second action plan adopted the vision of enabling secure multiple e-government services that were also customer friendly, integrated and efficient. The objectives of this second plan included the need to enhance the efficiency of e-services, promote cooperation and an innovative culture, improve the skills of citizens and to train and maintain government resources (Yesser, 2011).



**Figure 3.8: Yesser Second action plan: components (Yesser.gov.sa).**

Four main strategies identified various goals that need to be achieved to support this vision, such as training and skills development to support education and development perspective goals, and risk management and enhanced efficiency and quality of services to support business process perspective goals. Decreased costs and enhanced satisfaction of users would support customer service perspective goals, and reduced duplication in investment and maintenance of indirect value of government investment in the ICT sector to support value management perspective goals or value against money (Yesser, 2011).

According to Rose and Persson (2012) public values have been summarized into four main drivers; administrative efficiency, service improvement, citizen engagement and foundational values. Administrative efficiency could be expressed by cost effective and reflected in efficiency, effectiveness and economy values. Service improvement represents citizen’s orientation in several forms such as reducing in cost for citizens, better accessibility and shorter response time. Citizens’ engagement represents democratic process and citizen’s participation in decision making. Foundational values represent traditional bureaucratic values such transparency, rule of law, accountability and objectivity which translate into digital infrastructure in the e-government concept.

The values identified to support e-government in Saudi Arabia are illustrated below with endeavours adopted for this.



Figure 3.9: e-government values for KSA (Yesser.gov.sa).

**E-government projects: national initiatives**

It was 1962 when computers were first used in the public sector of Saudi Arabia to perform various statistics tasks within the Department of Statistics, and throughout the 1970s, the government encouraged other government departments to expand their use of IT, as this was considered critical for enhancing the country's economy. Over this period, the private sector rapidly applied technology for their applications, such as large industrial companies like Aramco (Oil Company), SABIC (petrochemical company), STC (Saudi Telecommunication Company), Saudia (Saudi Airline) and the banking sector. 80% of the private sector now uses computer technology systems, which has demonstrated a rapid increase in computer usage penetration. In contrast, the public sector has attempted to catch up with the private sector with various initiatives from government agencies (Yesser, 2011). Initiative projects adopted by the public sector will be discussed in the following section that relate to the application of e-government.

## **Saudi E-government Portal "Saudi"**

The integration of government e-services in one location portal is known as Saudi, which allows government departments, businesses, visitors, residents and citizens to gain benefit from this portal from any location and at any time. This service is either integrated within various government agencies or via links to relevant websites, and this national portal also offers users information about state regulations and general information about the kingdom, as well as a directory of government agencies, and the latest news and events across the country (Saudi e-portal).

## **SADAD E-Payment System**

In 2004, the Saudi Arabian Monetary Agency (SAMA) created a national electronic bill presentment and payment service (EBPP) known as SADAD, and was described as the best government project for improving service in the West Asia region, and was awarded a United Nations Public Service Award (Al Ghoson, 2010).

SADAD is responsible for a centralised database that operates online banking systems, telephone banking, automatic teller machines (ATMs) and streamlining and facilitating the payment of bills through bank channels from payments in any branch. Revenue from government agencies was required by the Ministry of Finance to be integrated within the SADAD system that operates as described below (sadam.com, 2012).

- At pre-determined times summary bill information is sent by billers to SADAD, which then validates the data and then uploads this on its database.
- Billers are notified of possible discrepancies and bill information is requested by customers through bank channels.
- SADAD receives the request from the bank, and then the bill information is retrieved by SADAD from its database, which is then forwarded to the customer.
- Bills to be paid are selected by the customer, and the customer's account is debited by the bank with a transaction confirmation.
- After the bank confirmation, the SADAD database is updated, and billers are notified accordingly.
- SARIE is then used by SADAD to initiate settlement instructions, and reconciliation reports from SADAD are received by billers that detail all transactions the SADAD has processed.
- The statuses of these bills are then defined as settled by SADAD.



### **Smart Card Project**

This project was intended to provide citizens with a smart identification that replaced the national ID card, and this advanced project centralised personal information, such as driving records, medical records, thumbprints and other personal identification information on a computer chip within the smart card (Alsabti, 2005). This project was intended to be extended to include other information, such as an insurance card, driving licence, family card and a digital certificate (Al Ghoson, 2010). This smart card information has enabled citizens of GCC countries (Saudi Arabia, Oman, UAE, Kuwait, Qatar and Bahrain) to travel between these countries using the smart card rather than official passports. Nevertheless, technical problems have hindered this development due to insufficient card reading machines at border crossings.

### **E-Umrah project**

Umrah is a pilgrimage to visit the holy mosques in Madinah and Makkah that is undertaken by Muslims from countries across the world that would require a visa, and although there has been no charge for visas, the large number of applicants has resulted in long delays of over three months. The e-Umrah Project was initiated by the integrated efforts of the Hajj, Foreign Affairs and Interior Ministries to simplify and speed up the process of issuing visas to within 24 hours. This electronic process replaced the requirement for paperwork to be sent by post between various Saudi Ministries and Umrah agents in countries across the world that had been time consuming (Alsabti, 2005; Al Ghoson, 2010).

### **Electronic Data Interchange Project (SaudiEDI)**

The Electronic Data Interchange Project was the initiative of the Ministry of Finance speed up transactions and improve transparency for the business sector, and in particular the expansion of e-trade in Saudi Arabia relating to import and export services. This has enabled customs clearance agents, cargo agents the General Organisation of Ports and the Customs Department to coordinate information electronically relating to import and export statements, delivery notes and manifests. These processes have now been integrated into one single procedure that has reduced the time for processing, expedition, submission and preparation by seven times, and cut costs by half. The project has contributed to enhancing trust and simplifying the interaction for citizens, the business sector and government agencies (SaudiEDI, 2011).

## **Al Madinah Almunawwarah E-Government Portal**

In an attempt to simplify coordinated services to the business sector (G2B) and to citizens (G2C), a portal was developed by the municipality of Almadinah Almunawwarah city, which was intended to improve e-government accessibility for citizens and to introduce efficient services (Al Sobhi et al., 2009). The implementation stage of this project has completed phases two and three that intend to provide high quality and faster services to businesses and citizens. This implementation stage has recognised the critical importance of human resources for success, and there has been an emphasis to raise awareness and improve the knowledge and skills of users. As a result, educational projects have been established at the same time as the improvement in the infrastructure coordinated by the Yesser project.

## **Human Resource initiative**

A cooperative venture by king Abdulaziz City for Science and Technology and the Ministry of Culture and Information resulted in the Saleemnet project that was intended to raise awareness of the Internet for children, adults and new users. An interactive approach was adopted that used animated cartoons and audiovisual materials to teach skills for using the Internet appropriately, and how to avoid disadvantages presented by the Internet. The important element of education was identified as critical in transforming the country into an information society (Saleemnet, 2011).

To bridge the gap of the digital divide which exposed for the low-income population and in rural areas the e-Training Caravan Project offered free training to raise awareness of ICT, which was coordinated by the private sector and the Ministry of Communication and Information Technology. This unique initiative provided portable classrooms with a trainer, training materials and computer hardware and software. The team travels between cities and villages offering training programmes for using the Internet and computers for around 10 hours, and then relocate to another location (MCIT, 2011a).

The Ministry of Communication and Information Technology has initiated the lectures of digital literacy and culture dissemination project to encourage young people to adopt information technology through schools and colleges, as well as young people in clubs and conference centres. The objective has been to move young people more towards the information society by raising their awareness of information and communication technology (MCIT, 2011b).

This transformation into an information society also relies on the media in helping to shape the knowledge and aspirations of citizens in adopting technology and its applications, and the dissemination of information networks and media ability measures a country's capacity. This has led to the Initiative of Training Program for Media Sector Project that focuses on targeting technical information pages in local newspapers and various journals that have a specialism in ICT (MCIT, 2011c).

Resistance to change is a barrier for bridging the digital divide and adoption of e-government programs, and the Yesser Project responded to this challenge by providing e-transaction training that involved basic computer skills and applications, and created a Chief Information Officer Program for government employees.

A specific focus has been given to the development of knowledge and skills of ICT for citizens, as well as human resources within Saudi Arabia, and the King Abdullah Scholarship Programme was supported directly by the Ministry of Higher Education and King Abdullah, which cost over four billion American dollars (Alshehri and Drew, 2010). The intention of this programme is to enable young Saudis to study at universities across the world to gain scientific knowledge and exchange cultural experiences. The objective of the programme is also to create human resources within Saudi Arabia that are professional and qualified to meet the country's needs, and to aspire for a knowledge-based economy created by a knowledge society (MOHE, 2010). Therefore, the vision is to ensure sufficient human resources that are qualified to support the public sector, private sector and Saudi universities. A further priority for this programme is e-government research to support the transformation and implementation of ICT by human resources that are highly qualified.

### **Initiatives for infrastructure improvement**

A Public Key Infrastructure (PKI) was established by the Yesser Project that focused on defining regulations and policies for security, and issuing digital certificates that support flow of information, safe and credible electronic transactions, data integrity to guarantee security, authenticating identities of users, and supporting information confidentiality from its digital certification centre (Al-Sabti, 2005). The Government Secure Network (GSN) was also set up by the Yesser Project to coordinate the work of government agencies into a secure e-government data centre, which supports e-government infrastructure, hosts national e-government portals and provides a foundation for creating the e-government network.

Government departments are also unified by the Communication, Liaison and Support Centre through various channels, but to ameliorate obstacles of regulations, the Yesser Project created specification guidelines (YEFI), so that instructions and principles between government agencies could be integrated and unified.

The Government Service Bus is another initiative created by the Yesser Project to integrate transactions related to government services, so that for all agencies participating in the programme, there is a common value add-shared service, such as a payment system that is unified for government departments, and identify management processes.

A consultation group has also been formed to help government agencies in their assessment, re-engineering, development and implementation processes (Yesser, 2011).

## **Saudi Arabia: M-government**

To improve communication between citizens and government agencies, e-government has adopted different means and channels of technology, such as digital TV, the Internet and mobile technology or mobile government (M-government). M-government could be defined as using mobile and wireless devices, applications, services and technology to benefit government departments, businesses and citizens as its central strategy and implementation (Kushchu, 2003). Therefore, this concept is not separate from e-government, but focuses on applying wireless and mobile services, as most citizens own a mobile phone, and this enables government departments to disseminate information about its services directly to citizens (Ghyasi and Kushchu, 2004). Therefore, a successful framework for M-government needs to include elements of scalability, flexibility, openness, security and interoperability (Antovski and Gusev, 2005).

The implementation of M-government applications has been supported by the rapid increase in use of mobile technology in Saudi Arabia, as well as the increasing availability of a reliable infrastructure, but as this service only delivers SMS messages from government agencies to citizen, these limitations place the country at an early stage of M-government adoption (Abanumy and Mayhew, 2005). One example of this technology has been notification of university acceptance and high school exam results for students since 2002, but this system has lacked confidentiality and privacy if others know a student's identification number.

SMS has also been used to remind patients of hospital appointment times and locations, as well as messages for successful applications to public or private events through the e-government communication programme. The Saudi Telecom Company (STC) also offers weather forecast information when citizens request this by sending a code from their mobile phone to a STC number, but this service is infrequently used as it is expensive (Abanumy and Mayhew, 2005).

## **UN Assessment of e-government Development**

The development of e-government in countries across the world is measured by the United Nations Department of Economic and Social Affairs and reports an average score of 0.4406, and the rank for Saudi Arabia is 58 (2010) with a score of 0.5142, which reflects significant improvement since 2008 when it ranked 70. In contrast, Bahrain ranks 13 for e-government globally, but within the developing countries e-government index, Saudi Arabia ranks 20. Factors, such as e-participating, human resource, infrastructure and e-services, have contributed to this improved evaluation of e-government achievements in recent years. The criteria for measuring e-services is based on the transaction stage and density of applications, as well as availability of websites, so Saudi Arabia ranks 75 globally with an index of 0.3111, which is above the average of 0.286, and scores 5 points for connected approach, 22 points for transaction services, 25 points for enhanced information services and 46 points for emerging information services.

The country also enables citizens to pay for utility services, use business services, file complaints and obtain personal documents from its national portal that links and integrates various government services. The ICT infrastructure of Saudi Arabia scores a high ranking of 44 with an index of 0.4031, which is above the average of 0.236, which is measured by the number of Internet, computer, broadband, mobile and fixed telephone users.

Saudi Arabia scores slightly above average (0.797) for human capital index at 0.8346, but only achieves a ranking of 106<sup>th</sup>, which is measured by the overall enrolment ratio for tertiary, secondary and primary schools and the adult literacy rate. The ranking of e-participation for the country is also low (102<sup>nd</sup>) and below the average (0.205) at a score of 0.1000, which was determined by survey into how citizens are consulted by government to gain opinions and feedback, how governments provide information and knowledge, and how government includes citizens in decision-making processes (UN, 2010).

Related Indices	Index	Rank
<b>Web Measure</b>	0.3111	75
<b>Infrastructure</b>	0.4031	44
<b>Human Capital</b>	0.8346	106
<b>E-Participation</b>	0.1000	102

**Table 3.2: Ranking of e-government development in Saudi Arabia (UN, 2010).**

### Saudi Arabia: Research into Technology Adoption

The transformation of many countries into an information society across the world due to information technology diffusion has resulted in reducing the size of the world to a smaller place, but in many developing countries the adoption of technology has remained at a low level, despite significant investment in ICT and its accessibility and applications. As a result of this failure, research studies have attempted to analyse the social, cultural, organisational, financial and technical factors that could foster or impede the adoption of e-government and technology in developing countries, and particularly Saudi Arabia. Al-Gahtani (2003) used the diffusion of innovation theory in a study of Saudi managers' computer work desks, and found a positive correlation between adopting and using a computer, but that trial ability, observability, compatibility and advantage were of relative correlation, and that computer use and adoption are negatively correlated due to complexity.

Technology acceptance related to desktop computer applications was also studied in Saudi Arabia by Al-Gahtani et al. (2007), who considered the cultural dimension of the country when applying UTAUT, which revealed significantly different results from those carried out in the USA. These results suggested a positive correlation between the subjective norm and performance expectancy with intention to use the technology, but between facilitation conditions with actual use of the technology and effort expectancy with intention to use this revealed no relationship.

Public relations professionals' adoption of the Internet in public and private sectors of Saudi Arabia was studied by Al-Shohaib et al. (2010), and used the diffusion of innovation model. These findings revealed that direct predictors of adoption were organisational encouragement and authoritarian decision-making, whilst in the private sector the critical factor for Internet adoption was shown to be a relative advantage.

In a study of factors that influence e-service usage and adoption in Saudi Arabia by, Al Ghaith et al. (2010), the diffusion of innovation theory was applied and the findings revealed that the significant factors were perceived complexity, privacy and compatibility, as well as Internet quality and relative advantage.

Al-Adawi et al. (2005) studied trust and risk literature and technology acceptance model to develop a model of citizen's adoption of e-government, and the findings separated citizens' intentions to use electronic transactions within e-government services and their intentions to find information from government websites. The findings suggested that there was a correlation between carrying out online transactions or obtaining information from government websites and perceived risk, trust, perceived ease of use and perceived usefulness.

In another study by Hamner and Al-Qahtani (2008), the technology acceptance model was applied to analyse factors in Saudi Arabia that influence citizens to adopt e-government, and the findings showed that e-government adoption and willingness for use were correlated with security issues, Internet knowledge, level of education and age. In contrast, in a study to identify barriers and challenges to e-government adoption in Saudi Arabia, Alshehri and Drew (2010) suggest five categories: financial barriers, leadership and management support, social barriers, organisational barriers and technical barriers. Trust, security, privacy and adequate ICT infrastructure aspects formed the main technical barriers, and lack of strategic planning, lack of awareness and promotion of e-government benefits, lack of collaboration and partnership between government agencies, lack of regulation and e-policy, resistance to change to e-services and lack of qualified human resources and training formed the main organisational obstacles. Religion and social characteristics were identified as the cultural challenges for social barriers.

Al-Solbi and Al-Harbi (2008) examined the link between e-government readiness in Saudi Arabia and public policy, and suggested that a critical e-readiness assessment tool should focus on the importance of regulating the use of the Internet through legislation and regulation issues.

The following table will examine the key studies with regards technology adoption in Saudi Arabia and summarise the main findings.

Study	Topic	Finding
Al-Gahtani, (2003)	Correlate between perceived innovation attributes with computer technology adoption.	Compatibility, relative advantage, trialability, complexity, and observability affect computer adoption.
Al-Gahtani et al. (2007)	Use of IT Culture and the acceptance based on UTAUT.	A significant correlation between subjective norm with the intention to use the technology performance expectancy and
Al-Shohaib et al. (2010)	Private and Public Sectors of Saudi Arabia: Factors Influencing the Adoption of the Internet by Public Relations Professionals.	Authoritarian decision making, relative advantage and organizational encouragement as predictors of adoption.
Al-Ghaith et al. (2010)	E-services usage and adoption in Saudi Arabia: influencing factors.	Most significant factors affecting the adoption of e-services were perceived complexity, privacy and compatibility.
Hamner and Al-Qahtani (2008)	E-government based on ATM: factors affecting individuals to accept.	E-government adoption affected by age, level of education, internet knowledge and security issue affect.
Alshehri and Drew (2010)	E-government adoption in Saudi Arabia: challenges and barriers.	Financial barriers, technical barriers, social barriers, organizational barriers, and leadership and management support.
Al-Adawi et al. (2005)	Technology acceptance model and trust and risk literature: citizen's adoption of e-government	E-government adoption affected by perceived ease of use, perceived usefulness, trust and perceived risk.
Al-Solbi and Al-Harbi (2008)	Saudi Arabia: public policy and e-government e-readiness.	E-government e-readiness: legislation and regulation issues.

**Table 3.3: Saudi Arabia: Technology Adoption Key Research**



## Conclusion

This chapter has attempted to analyse factors that could hinder or promote the adoption by citizens of e-government services by highlighting cultural, social, geographical, technical, political and economic issues and other characteristics faced by Saudi Arabia. The fastest growing ICT market in the Middle East and a strong economy support the motivations of Saudi Arabia to adopt e-government services, and this is also supported by a large youth population with higher levels of education that would be likely to overcome the barrier of resistance to change. In addition, the climate of Saudi Arabia produces very high temperatures across the country and its large area are factors that would encourage citizens to avoid visiting government offices and use e-government services in preference. The importance of the country as a place of pilgrimage for Muslims across the world also requires government departments and agencies to use an advanced system to coordinate large numbers of these people. Another important factor that encourages the implementation of e-government has been support from the King and senior government ministers.

In contrast, other factors hinder e-government adoption and implementation for the country, such as an inadequate infrastructure that needs to be secure and unified, a lack of regulations and policies related to new technology, insufficient qualified human resources, and lack of trust from users related to concerns about security and privacy frameworks.

Religious adherence, collectivism and tribal systems influence the culture of Saudi people, which often make them reluctant to change, but e-government could be compatible with this culture if cultural issues are considered when promoting the adoption of e-government.

This chapter has discussed the current situation of e-government adoption and implementation in Saudi Arabia and presented an overview of its culture and society. The chapter considered some organisational, political, technical and social issues which influence the implementation of e-government in Saudi Arabia. The next chapter will analyse what factors influence the adoption of e-government by citizens, and reveal the theoretical background in the literature review.

# Chapter 4: Theoretical Research

## Introduction

The theoretical background relating to the user's adoption of technology is discussed in this chapter, which will include a review and investigation of earlier research relating to citizens' adoption of e-government. The chapter will also highlight the key constructs that influence the adoption of e-government in different countries. The importance of social-cultural factors will be discussed in the following section in order to predict citizen's intention to adopt the technology by acceptance or use. This section will also consider specific characteristics that relate to the Arab world and emphasis on the relevant cultural dimensions of Saudi Arabia in particular. Saudi Arabia shares similar customs, traditions, and tribal relationships with the other Gulf Cooperation Council (GCC) countries. Hofstede, (1991) analysis of the Arab world culture dimensions includes Egypt, Iraq, Kuwait, Lebanon, Libya, Saudi Arabia, and the United Arab Emirates, where the Muslim faith plays a major role. He found that Saudi Arabia is close if not identical to other Arab countries where Islam plays a significant role in the individual's life. Research hypotheses will be developed in accordance with previous models and theories, with a focus upon the socio-cultural characteristics of the Saudi Arabia case study. A conceptual research model will be proposed to conclude the chapter, which will include detailed socio-cultural, technical, psychological, behavioural and demographic variables that may affect the citizen's adoption of e-government. The chapter will conclude with a review of the main areas that have been discussed in this chapter, as well as re-emphasising the objective and purpose of this study.

## Adoption's Theories and Models

A crucial condition for the successful implementation of the system is individual acceptance of new innovation. Users' acceptance of technology relates to the "initial decision made by the individual to interact with the technology" (Venkatesh et al., 2003: p. 446). In e-government field of research, there is no comprehensive model that embraces the salient variables, and refers to cross-cultural aspects relating to citizen's adoption of e government. It is the intention of this study to review various theories and models from different fields of research, which include psychology, sociology, as well as technological acceptance and motivational aspects in order to build a conceptual model of the adoption

of e-government. According to Venkatesh et al. (2003), researchers select suitable and favoured models, whilst ignoring contributions from alternative models.

The following section will therefore consider the Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003); the Diffusion of Innovation Theory (DOI) (Rogers, 1995); Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975); the Technology Acceptance Model (TAM) (Davis, 1989; Davis et al., 1989) and the Theory of Planned Behaviour (TPB) (Ajzen, 1991; 1988; 1985; Ajzen and Fishbein, 1980). These theories which consider as a foundation for this study to identify the salient factors affecting the adoption of e-government among Saudi citizens will be presented in the next section.

### **Theory of Reasoned Action (TRA)**

One of the fundamental and basic theories from the social psychology field that is used to evaluate human behaviour is the Theory of Reasoned Action (Fishbein & Ajzen, 1975). Lean et al. (2009) consider that TRA is one of the first theories that include an assessment of personal behaviour towards the utilisation and acceptance of computers. The theory maintains that it is belief that affects the intentions of humans, and intention influences the action of humans (Be' langer and Carter, 2008). This concept model reveals that behaviour is subject to personal attitudes and subjective norms, and defined as “an individual’s positive or negative feelings (evaluative effect) about performing the target behaviour” (Fishbein and Ajzen, 1975; p. 216). Subjective norm is “the person’s perception that most people who are important to him think he should or should not perform the behaviour in question” (Fishbein and Ajzen, 1975; p. 302). It is assumed by this theory that people are rational and make systematic use of the information system available to them. The theory also assumes that human beings consider the implications of their actions before they behave in a certain manner, and attempts to predict and understand motivational influences that are not under personal control. The identification of how and where to target strategies for behavioural change are considered, as well as explaining new human behaviour.

High predictability of the theory is confirmed by Sharma (2007), unlike other researchers, who claim that the theory offers little predictability of people with less behaviour control. TRA is solely dependent upon the motivation of the individual, and neglects the personal ability to carry out the task.

This study aims to examine the adoption of e-government behaviour which will be measured by the intention to use the system. Therefore, this theory suggested building a belief of the system to determine the intention behaviour which could be maintained by spreading the awareness of the system and its benefits. Moreover, this study needs to consider society opinion about the application which highly predicts the intention to use.

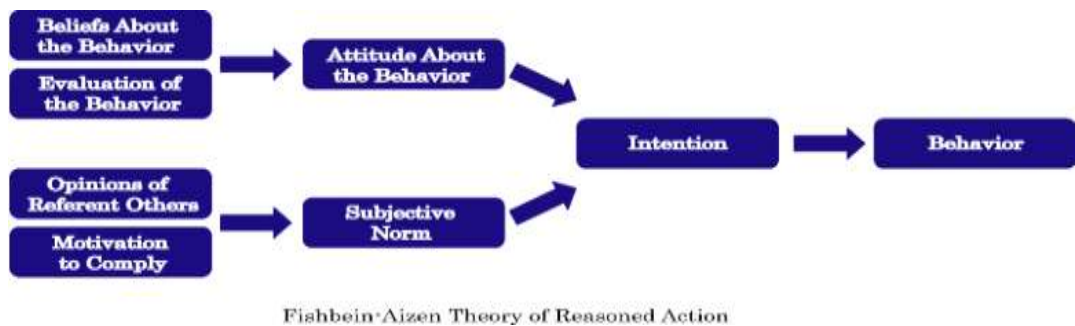


Figure 4.1: Theory of reasoned action (Fishbein & Ajzen, 1975).

### Theory of planned behaviour (TPB)

The limitations of TRA are discussed by Ajzen (1991), who extended the theory to cover people with little control over their behaviour. An additional component to the model, known as the degree of Perceived Behavioural Control, is added and expressed as "the perceived ease or difficulty of performing the behaviour" (Ajzen, 1991; p. 188). This concept has added an explanatory power to theory in the field of information systems, described as "perceptions of internal and external constraints on behaviour" (Taylor and Todd, 1995; p. 149).

Two components are brought together within Perceived Behaviour Control, which are 'self efficacy' and 'facilitating conditions'. Self-efficacy is described by Bandura (1982) as an individual's self-confidence in his or her ability to perform a certain type of behaviour, whilst Triandis (1971) refers to facilitating conditions representing the resources needed to engage in certain behaviour. Perceived Behavioural Control is described by Lean et al. (2009) as providing a reliable prediction of the adoption of e-government adoption, because citizens are denied full control of online transactions. In the field of e-government it is suggested that TPB, having both the knowledge, as well as the tools to facilitate government transaction electronically, influences behaviour control.

Positive attitudes, subject norm and greater control strengthen citizens' intention to perform certain behaviour (Ajzen, 1991). TPB is considered as an extension to TRA, as well as the basis of the Technology Acceptance Model (TAM) which will be discussed later in details. Despite this, TRA and TPB have a number of limitations, including a lack

of personal and demographic variables and subjective measurements to perceived behavioural control. TPB operates solely when behaviour is under volitional control and there is no consideration of unconscious motives.

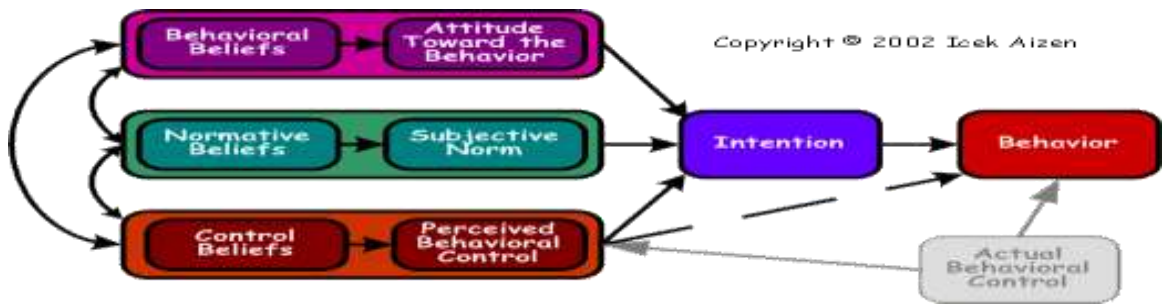


Figure 4.2: Theory of planned behaviour (Ajzen, 2002).

### Motivational Model (MM)

Ryan & Deci (2000) comment that motivation is related to energy, direction, persistence and equifinality, which are all aspects of activation and intention. Deci (1975) states that motivation is classified into intrinsic and extrinsic; intrinsic motivation is defined as the conduct of the person towards the environment, which requires feelings of competence and self-efficiency in order to maintain motivation. Enjoyment influences intrinsic motivation positively, which is to the extent that “the activity of using a specific system is perceived to be enjoyable in its own right, aside from any performance consequences resulting from system use” (Venkatesh, 2000; p. 351).

Extrinsic motivation is related more closely to achievement and increases in value through money, promotion, rewards, as well as other tangible benefits, and is thought of as a significant motivator in literature relating to information systems. Davis et al. (1992), for instance, suggests that perceived usefulness is represented by extrinsic motivation, whilst intrinsic motivation refers to enjoyment; intrinsic motivation is concerned with the success and adoption of information systems.

### Model of PC Utilisation (MPCU)

Personal behaviour and the prediction of computer utilisation, rather than intention to use, is considered by Thompson et al. (1991), which is mostly based upon Triandis’ (1977) theory of human behaviour. Thompson et al. (1991) attempt to predict personal acceptance and behaviour to use information technology in a model that is made up of six components. These are job fit, long-term consequences, complexity, social factors, affect towards use, and facilitating conditions. Job fit is “the extent to which an individual believes that using [a technology] can enhance the performance of his or her job”

(Thompson et al., 1991; p. 129), and complexity known as “the degree to which an innovation is perceived as relatively difficult to understand and use” (Thompson et al., 1991; p. 128). Long-term consequences are described as “outcomes that have a pay-off in the future” (Thompson et al., 1991; p. 129), which is based upon Triandis (1977), where affect toward use is described as “feelings of joy, elation, or pleasure, or depression, disgust, displeasure, or hate associated by an individual with a particular act” (Thompson et al., 1991; p. 127). Social factors are described as "the individual’s internalisation of the reference group’s subjective culture, and specific interpersonal agreements that the individual has made with others, in specific social situations” (Thompson et al., 1991; p. 126). Facilitating conditions, defined in an information system context, are the “provision of support for users of PCs may be one type of facilitating condition that can influence system utilisation” (Thompson et al., 1991; p. 129).

**Social Cognitive Theory (SCT)**

One of the most powerful theories in human social behaviour is Bandura’s Cognitive Theory (1986), which examines the relationship between personal beliefs and its influence upon human behaviour, on the basis of what people think, believe, and feel affects how they behave (ibid). According to this theory, no one lives in isolation, and the social network has an impact upon personal action. Self-efficiency or personal judgment of the ability to use the technology, as well as issues that evoke anxious feelings or emotions affect the adoption of technology. Compeau and Higgins (1995) claim that the main factors within social cognitive theories are Outcome Expectations-Performance, because performance is behaviour related, which includes job performance. Outcome Expectations is personal and related to consequences of behavioural issues, such as personal accomplishment and self esteem.

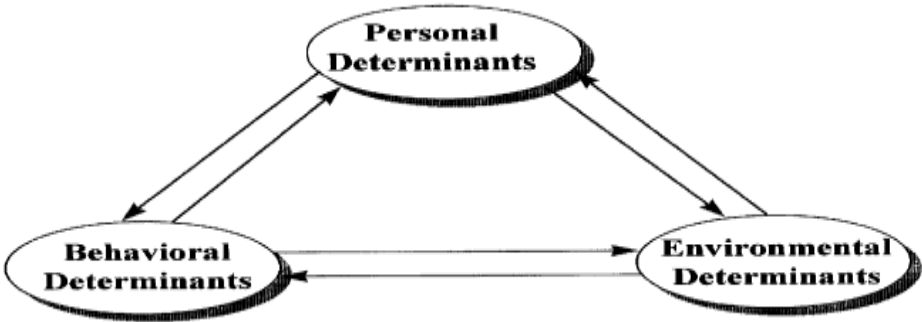


Figure 4.3: Social cognitive theory (Bandura, 1986).

**Diffusion Of Innovation Theory (DOI)**

One of the popular sociology models is the Diffusion of Innovation Theory, which is used within a number of innovations to evaluate its user dissemination. The process of innovation adoption is described by Rogers (1983; p.21) as “the process through which an organisation passes from first knowledge of an innovation, to forming an attitude towards the innovation, to a decision to adopt or reject, to implementation of the new idea”, and that the awareness of characteristics of an innovation has an impact upon the intention of the individual to use the technology (Rogers, 1995).

Diffusion is described by Rogers (1995) as “the process by which an innovation is communicated through certain channels over time among the members of a social society” and the innovation as “an idea, practice, or object that is perceived as new by an individual or other unit of adoption” (Rogers, 2003: p. 12). Innovation distribution is dependent upon the relative complexity, advantage, trialability, compatibility and observability, with the advantage being “the degree to which an innovation is seen as being superior to its predecessor (Rogers, 1995; p. 12)”. Complexity relates to the degree of difficulty in using and adopting the technology, whilst compatibility is “the degree to which an innovation is perceived as being consistent with the existing values, needs, and past experiences of potential adopters” (Moore and Benbasat, 1991; p. 195). Trialability refers to degree to which an idea may be experimented with on a limited basis (Rogers, 1995), whilst observability relates to the visibility of the innovation result. The differences within the theories of innovation suggest that an innovation offering higher relative advantages, triability, compatibility, observability and lower complexity will be disseminated earlier (Rogers, 2003). Most of the researchers affirmed that relative advantage, complexity and compatibility are considered the main constructs influence the diffusion of technology in DOI. However, other variables in DOI such as observability and triability were not applicable for measuring new technology adoption (Bradford and Florin, 2003).

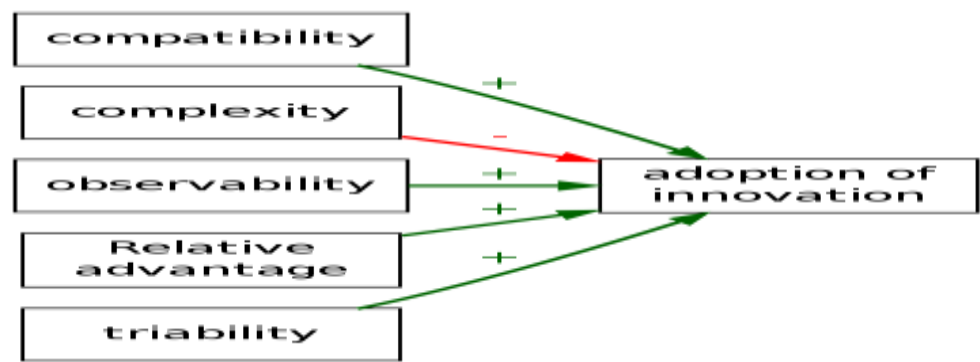


Figure 4.4: Diffusion of innovation theory (Rogers, 2003).

## **Technology Acceptance Model (TAM)**

Davis et al. (1989) developed the Technology Acceptance Model, which was designed to predict the acceptance of software technology by the employees of an organisation. The model was based upon a psychological theory of reasoned action (TRA) devised by Fishbein & Ajzen (1975), which states that belief influences intention and intention influences action. The attitude of an individual is the focus of TAM, and its focus upon personal intention to use, as well as the actual use of the technology.

Benbasat & Barki (2007) consider that TAM is the most widely accepted and used model within the literature, being applied to various fields, including management, business and information systems. Two psychological dimensions, Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) and the effect upon individual attitudes toward the actual usage of the technology are considered within TAM. Perceived Usefulness (PU) is known as “the degree to which a person believes that using a particular system would enhance his or her job performance” (Davis, 1989; p. 320). Perceived Ease of Use (PEOU) is defined as “the degree to which a person believes that using a particular system would be free of effort” (Davis, 1989; p. 320). This model considers that higher perception of external variables, which include Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) will enhance internal personal beliefs, intentions and attitudes.

However, TAM ignores the social norm factor which was validated in TRA. Though TAM has been enhanced to form TAM2 by including social variables that are subjective norms in the components of the model as additional predictors of personal intention to use the technology. Venkatesh and Davis (2000) also commented that subjective norms positively affect the personal image to use the technology among social networks, and as indicated in TAM2. Benbasat and Barki (2007) consider that TAM has major limitations, such as its explanatory power and extendibility. The model focuses solely on the paradigm in the explanatory powers at the expense of determining and clarifying grounded variables. In addition, this model fails to provide extension facilities or a mechanism to include additional future variables. Perceived benefits are only considered by TAM, whilst TRA and TPB have considered negative, as well as positive beliefs. TAM ignored the emotional choices and considered the acceptance of technology instead of usage behaviour. As a result of such limitations, a number of researchers integrate various models in order to ameliorate the limitations of single model or theory.



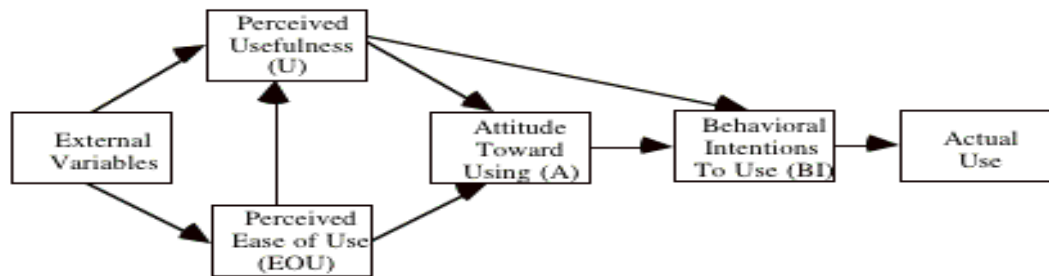


Figure 4.5: Technology acceptance model (Davis et al. 1989)

## Unified theory of acceptance and use of technology (UTAUT)

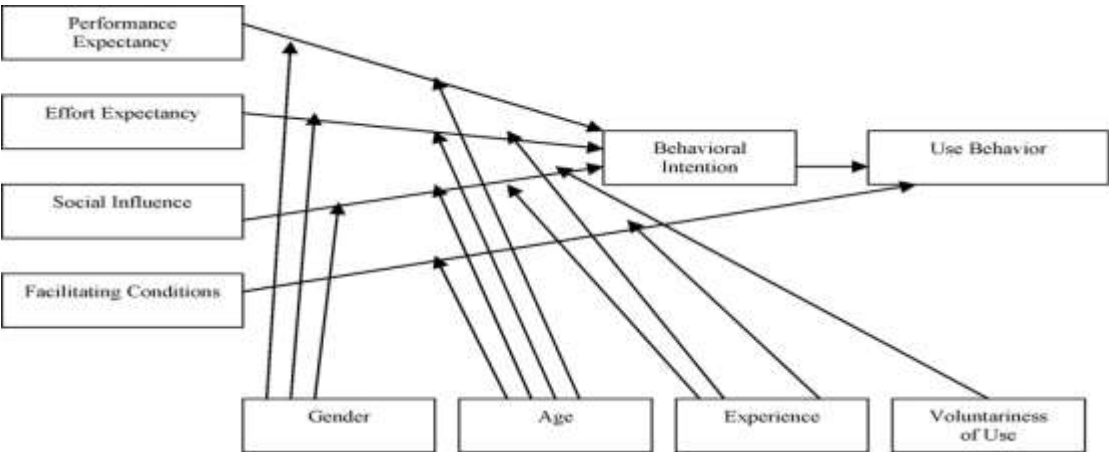
A synthesised comprehensive model, the Unified Theory of Acceptance and Use of Technology model (UTAUT), was proposed by Venkatesh et al. (2003). Eight models that considered technology and human behaviour were combined into an integrated model in order to explain 70% technology usage variance. The models combined in the UTAUT which have been discussed in details in the previous sections are Social Cognitive Theory (SCT) (Bandura, 1986); Innovation Diffusion Theory (IDT) (Rogers, 1995); Model of Personnel Computer (PC) Utilisation (MPCU) (Thompson, Higgins, & Howell, 1991); Theory of Planned Behaviour (TPB) (Ajzen, 1991); Combined TAM-TPB (Taylor & Todd, 1995); Motivational Model (MM) (Davis, Bagozzi, & Warshaw, 1992, as cited in Venkatesh et al., 2003); Technology Acceptance Model (Davis, 1989; Davis et al., 1989) and the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975).

Three direct determinants of behaviour intention to use the technology are included in UTAUT, which are social influence, effort expectancy and performance expectancy. Two direct determinants of actual use of technology are included within UTAUT, which are facilitating conditions and behaviour intention. In addition, the model contains four moderating variables that have an effect upon the direct determinants, which are age, gender, voluntariness of use and experience.

"Performance expectancy is defined as the degree to which an individual believes that using the system will help him or her to attain gains in job performance" (Venkatesh et al., 2003; p.447). Expectancy factor performance is based upon perceived usefulness (TAM/TAM2 and C-TAM-TPB), extrinsic motivation (MM), job-fit (MPCU), relative advantage (IDT), and outcome expectations (SCT). "Effort expectancy is defined as the degree of ease associated with the use of the system" (Venkatesh et al., 2003; p.450). Effort expectancy is based upon perceived ease of use (TAM/TAM2), complexity

(MPCU), and ease of use (IDT). Social influence that is "the degree to which an individual perceives that others believe he or she should use the new system" (Venkatesh et al., 2003; p.451). Social influence is shown as a subjective norm in TRA, TAM2, TPB/DTPB and C-TAM-TPB, social factors in MPCU, as well as image in DOI.

Facilitating conditions, which is “the degree to which an individual believes that an organisational and technical infrastructure exists to support the use of the system” (Venkatesh et al., 2003; p.453) is based upon perceived behavioural control (TPB/DTPB, C-TAM-TPB), facilitating conditions (MPCU), and compatibility (IDT). Behavioural intention is “the person’s subjective probability that he or she will perform the behaviour in question” (Fishbein & Ajzen, 1975; p. 288).



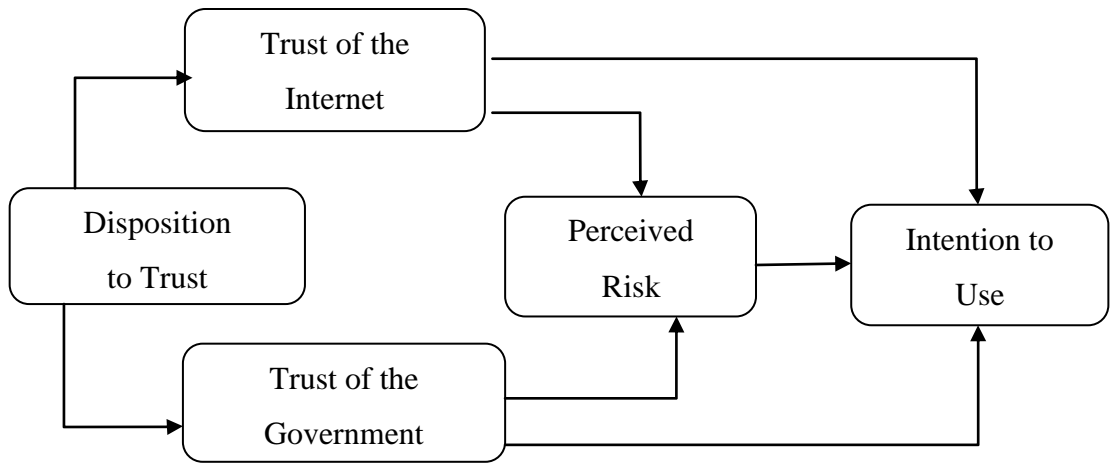
**Figure 4.6: Unified theory of acceptance and use of technology (Venkatesh et al. 2003).**

TAM is considered by Benbasat & Barki (2007) to have failed to provide a mechanism for the inclusion of other constructs due to sought of simplicity in developing the model when transitioning from TRA. UTAUT has attempted to deal with this limitation by returning the social norms of TRA and the perceived behavioural control of Theory of Planned Behaviour (TPB). However it has been unable to return extension facilities and neglects the concepts of attitudes and beliefs. Although that UTAUT Model is proposed based on the similarities of these independent variables from different models and ignores the belief mechanism, it provides further explanation and prediction of users’ behaviors that any older individual models could not have achieved alone. According to Weerakkody,et al. (2013) the UTAUT model is the benchmark and most predictive model in the technology acceptance literature. TRA and TPB consider both human and psychological behaviour and TAM and UTAUT focus upon technological acceptance as an ultimate target for the models, whilst dissemination aspects are emphasised by DOI.

**E-government adoption: Model of trust and risk**

A model of trust and risk in e-government adoption was proposed by Belanger and Carter (2008). Four main components are included in this model, which are: Perceived Risk, Trust of the Internet (TOI), Trust of the Government (TOG) and Disposition to Trust. "One's general propensity to trust others and composed of faith in humanity and trusting stance" is the definition of Disposition to Trust, according to Belanger and Carter (2008; p.4). Faith in humanity makes the assumption that people are trusted in nature, whilst trust assumes a better outcome by cooperating with others (McKnight et al., 2002). Risk is lack of behavioural control, involving in this case (1) economic risk, (2) exposure of personal information, and (3) imperfect monitoring (Warkentin et al., 2002). The definition of perceived risk relates to the citizen's subjective expectation of experiencing losses as a result of following an outcome that may be desirable (Warkentin et al., 2002); perceived risk reduces as trust increases. The fundamental factors that affect trust are trust of the Internet that is linked to the belief of citizens that the Internet is a dependable medium, as well as a safe place to perform secure transactions, together with trust of organisations that is associated with a belief in the capability of agencies, as well as the ability of staff to provide online services in a confidential manner.

This model of trust assumes that disposition to trust has a positive impact upon trust of the government, as well as the Internet, as well as the personal intention to adopt e-government. According to Belanger and Carter (2008), trust of the government has a negative effect upon the perceived risk that influences citizens' intentions to use the services offered by e-government.



**Figure 4.7: E-government adoption; Trust and Risk (Belanger and Carter, 2008).**

Psychological, social and technical theories, as well as models used to measure personal behaviour and intention to use technology were discussed in the previous section. These theories were adapted from different field to evaluate the acceptance of new innovation among users. The next section will examine the literature relating to citizen's adoption of e-government by applying aforementioned models and theories.

## **Research into Citizens' Adoption of E-government**

According to Gilbert and Balestrini (2004) much of the earlier research into user's adoption of innovations, such as the Internet used three approaches:

- The Diffusion of Innovation Theory (DOI) evaluates the dissemination of innovation in society over time.
- The Technology Acceptance Model attempts to explain how people use and accept innovations, such as the Internet.
- The Service-quality-based model attempts to understand earlier incidents that have an impact upon the behaviour of consumers trying to use new technology.

A model combining both attitude-based and service-quality-based approaches in the examination of citizen's adoption of e-government is suggested by Gilbert and Balestrini (2004). Willingness to use e-government transactions is seen as a dependent variable, whilst perceived barriers and perceived relative advantages are regarded as independent variables in this model. Perceived barriers include safety, visual appeal, enjoyment, ease of use, compatibility and reliability as important factors that may challenge or impede adoption. In addition, perceived relative advantage relates to time, cost, control, convenience, personalisation, as well as avoiding personal interaction as factors that may encourage and facilitate adoption. The study indicates that financial security, trust and the quality of information are significant barriers that affect adoption, whilst saving money and time are considered as potential benefits that influence the intention to use e-government services.

Factors for successful e-government adoption in Canada (leader country in e-government development) were studied by Kumar et al. (2007) who proposed a model that contain relevant influence variables and categorised the factors that affect adoption into website design variables and users' characteristics. The characteristics of users included perceived

risk, experience of the Internet, and perceived control, in addition to website design to assess perceived usefulness and ease of use as factors of influence relating to e-government adoption. Service quality also positively affects users' satisfaction of the services. However, these studies were conducted among high developed countries which have different capabilities, values and expectations than the other developing countries.

One of the first researchers to consider theoretical salient factors that influence citizens' adoption of electronic government in the U.S.A were Carter and Belanger (2004). These researchers utilised the diffusion of innovation theory among 140 students to investigate factors that influence e-government adoption by citizens, which revealed that relative advantages, image and compatibility significantly affect citizen's intentions to use e-government services.

In another study, Carter and Belanger (2005) combined the Technology Acceptance Model (TAM), Web Trust Model and the Diffusion of Innovation Theory (DOI) to develop a comprehensive model that contains relevant factors affecting citizen's adoption of e-government. 140 undergraduate students were used in the sample for the study, which revealed that compatibility, relative advantage and perceived usefulness are significant indicators of user's intention to use e-government services provided by the state. This model also explains citizens' variance of 63.5 % in using online government transaction services. However, the efficacy of using undergraduate student as a sample frame to evaluate technology acceptance is questionable as the generalisability of the research is limited.

Dimitrova and Chen (2006) considered psychological characteristics, information channels and civic mindedness when adopting e-government services in the USA. This study, which was based on DOI and TAM in the assessment of non-demographic variables, together with their impact upon citizens' adoption of e-government used a national structured survey. Results revealed the significant influence of civic mindedness, perceived usefulness, and perceived uncertainty in the adoption process. In addition, the research confirmed the effect of mass media channels over interpersonal communication on USA e-government adoption.

Lean et al. (2009) used the same theories to develop a model made up of factors that influence Malaysian citizens to use e-government by asking 195 participants to complete a structured questionnaire. TAM, DOI and Trust models were combined with five dimensions, which are: perception of non-repudiation, perception of data integrity, perception of confidentiality, perception of authentication and perception of privacy. The study came to the conclusion that perceived relative advantage, trust, perceived image and perceived usefulness have a significant and positive influence upon the intention to use e-government services, whilst perceived complexity has negative impact upon intention to use e-government. This research also revealed that perceived strength of non-repudiation and perceived strength of online privacy have a positive influence upon citizens' trust in using e-government services. DOI has a better explanatory power over the other construct models, according to the claims of these researchers as most of the significant predictors come from this theory.

A conceptual model of e-government adoption by citizens in exploiting a tax pay online service was suggested by Warkentin et al. (2002) as one of the more popular services among users. Catalyst variables that affect the adoption among the citizens were included in the study, such as perceived usefulness, perceived risk, perceived ease of use and perceived behaviour control. Research results concluded that trust is the most significant factor that affects citizens' adoption of e-government.

A further study utilised an online tax filing and payment system, which was based upon the Theory of Planned Behaviour (TPB) and explored public acceptance of Taiwan e-government services (Hung et al., 2006). This study featured a comprehensive model in a structured questionnaire of factors that influence users when using e-government services. Research conclusions suggest that ease of use, perceived usefulness, external influence, trust, perceived risk, compatibility, self-efficacy, interpersonal influence and facilitating conditions were highly important factors in the adoption of e-government services in Taiwan. Wangpipatwong et al., (2008) asserted that when the Computer Self-efficacy factor is combined with TAM, perceived ease of use and perceived usefulness have a strong impact upon the continuance intention of citizens to use Thailand's e-government services. However, most of the previous studies have emphasised in the e-services' adoption among single application such as taxpaying which limited the generalisability of the study as different government's applications require various features and level of engagement.

The technology acceptance model was validated by Lin et al. (2011) in a developing African country (Gambia) by applying the model among 167 e-government workers. A structured questionnaire was distributed by e-mail to participants in order to discover the intention of citizens to use e-government services. A strong core construct effect of TAM to predict citizen's intention to use e-government was revealed by the research. The study showed that both Perceived Ease Of Use (PEOU) and Information Quality (IQ) have a positive influence on perceived usefulness (PU) among the citizens of Gambia when using e-government, and that PEOU has a significant effect upon citizens' attitudes to use e-government services. Despite this, PU fails to have a significant link with citizen's attitudes and behaviours to use e-government services among Gambian's citizens, which is due to poor infrastructure within Gambia.

Technology acceptance models are useful both as a predictive method, in order to assess the likelihood of people and organisations to adopt a particular new technology, or as a evaluation technique to assess acceptance of technology already in use (Turner et al., 2010). One of the key predictor of the IS successful is the exploiting of the system and how well the system accepted and used. Hence, it is intention to use, acceptance and actual use of the system that will enable organizations to attain the expected benefits of IT/IS. Therefore, it is crucial to research the elements that lead to acceptance or rejection of technology by users. Usage and acceptance of technology is one of the main elements behind the gaining competitive advantages from IS and improve organizational efficiency and effectiveness (Mojtahed, et al. 2011).

A further study was study carried out by Yonazi et al. (2010) in another developing African country (Tanzania), in order to explore factors that influence citizens' adoption of e-government. A case study methodology was used in this study within three government departments. The study revealed that intrinsic service issues, such as information and websites characteristics, citizens' preparedness, perceived organisational preparedness, organisational context and limitations of access have a considerable impact upon the adoption of Tanzanian e-government services by its citizens.

Doong et al. (2010) examined psychological traits of 206 citizens by considering how the citizen's innovative cognitive style and involvement affect their loyalty intention to use an e-government service in Taiwan, which was called e-housekeeper; Taiwan was the world e-government leader concerning e-readiness in 2002, 2004 and 2005. The conclusions of

the research revealed that the “consumption of newness” from those who are more likely to perform new activity than others fail to have loyalty to the service for a long period of time. By contrast, involved citizens who have both interaction and perception with the service demonstrate greater loyalty than citizens who are less involved. It appears from the conclusions, that a combination of both involved citizens and innovators has a positive impact upon their likely continuance to use the services provided, together with strong loyalty intention from involved citizens. Random sampling is suggested as more effective in future research to provide greater generalisation and identification of actual behaviour, rather than using loyalty intention.

The impact of the demographic variables on the adoption of e-government in Turkey was confirmed by Akman et al. (2005). Gender differences were considered as a significant factor that affects the adoption of e-government, as well as education levels. Males were considered more likely to utilise e-government than females, whilst adoption levels increased in accordance with education levels.

A study of the UK ‘Government Gateway’ (Choudrie and Dwivedi, 2005) examined the awareness of citizens and their adoption of e-government services by using demographic characteristics. A postal survey and self-administrated questionnaire was utilised in the study, which was distributed using stratified random sampling to 1600 participants; however, only 358 usable responses were received. The research revealed that demographic variables, such as gender, age, social class and education have an important impact on the awareness of citizens and their adoption of e-government. The study also reveals that citizens accessing the Internet from home are more likely to be aware of and adopt e-government services.

E-government services adoption at the transaction stage was studied by Horst et al. (2007) by weighting the advantages and risks of the adoption in Netherlands. A sample of 238 questionnaires was used in this 2003 study in order to evaluate citizens’ intentions to use e-government. The study was based upon previous technology acceptance theories and models, and examined subjective norms, worry of e-services, perceived usefulness, past experience of the Internet, perceived behaviour control, perceived risk and trust influencing e-government adoption. It was concluded that perceived usefulness is a strong predictor of citizens’ intention to use e-government services. Subjective norms, perceived behaviour control, past experience and perceived risk also significantly affect the



usefulness perception, yet trust was the main determinant of perceived usefulness in e-government adoption process. The study also suggested that future research should use different and larger samples.

Unified Theory of Acceptance and Use of Technology (UTAUT) (amended version) was utilised among university students in another developing country, Kuwait, which is one of the Gulf Countries (AlAwadhi and Morris, 2008) to examine the citizens' adoption of e-government. 880 questionnaires were distributed among students studying humanities and science. The study replaced social influence with peer influence in order to match student society. Performance expectancy, effort expectancy and peer influence were all found to determine students' behaviour intentions, while facilitating conditions and behaviour intentions influence students' use of e-government services. The use of wider samples was suggested by the study, together with more model variables, such as trust and culture in order to generalise outcome in developing countries.

Qatari citizens' intention to adopt e-government using UTAUT was studied by Al-Shafi and Weerakkody (2009). Four interviews with citizens were conducted, together with three interviews with researchers. 250 questionnaires were also distributed among students in order to describe citizens' behaviour towards the adoption of e-government. The study findings concluded that performance and effort expectancy, together with social influence have a significant impact among the decision of Qatari citizens to adopt e-government. Demographic variables, such as age, gender and Internet experience appear to be insignificant predictors of citizens' intentions to use e-government services. However, the sample frame of the undergraduate students restricts the generalisation of the studies to that sample and could be bias to limited stratum of age which ignored the effect of the age variable.

UTAUT fails to include demographic variables, apart from age and gender, and therefore cannot moderate mental determinates. In addition, the theory fails to consider the supply side of the service, including digital media (Van Dijk et al., 2008). UTAUT was enhanced by including position on society, education levels and position in the family position to existing demographic variables. Experience of digital media and access, channel preference and knowledge of services were also added to the supply side. A multidisciplinary model was also added, which used the survey method that was applied to the Dutch population, in order to explain the use and acceptance of e-government services

by citizens. A weak correlation between the socio–demographic and psychological factors and the acceptance and use of technology was revealed by the study. The conclusions of the study revealed a significant impact of the availability of the Internet, digital channel preference, knowledge of availability together with the skill and experience of the technology toward e-government usage and acceptance. The acceptance and use of e-government is a matter of learning, and dynamic methods should be used for its analysis. As a psychological core in this field of research, social cognitive theory is more explanatory than UTAUT (Van Dijk et al., 2008).

A model for the adoption of e-government (GAM) was proposed by Shareef et al. (2011) in order to determine the critical factors affecting the adoption of e-government during various developmental stages. A Canadian study used a survey distributed among 239 users of e-government services, which was based upon the TAM, DOI and TPB model. The model includes perceived awareness, attitudes to use, ability to use that is measured by perceived ability to use, and adherence to use, which is assessed by perceived functional benefit, as critical factors affecting the adoption of e-government services during the statistics (GAM-S) stage. Availability of resources, perceived trust, perceived image, perceived information quality, multilingual options and computer self-efficacy were all considered as important factors affecting the adoption of e-government adoption at the statistics stage.

Attitude to use is determined by perceived awareness, assurance to use which is measured by perceived information quality, ability to use, and perceived trust, and adherence to use that is determined by perceived image are important factors influencing e-government adoption during the interaction stage (GAM-I). Other variables, including availability of resources, multilingual options, computer self-efficacy and perceived functional benefits are regarded as unimportant variables when adopting e-government at the interaction stage. A re-validation of the empirical model among developing countries is recommended by Shareef et al. (2011) in future research.

Local authorities in the UK spend £5 million in order to encourage citizens to use online services. A media campaign was launched that was intended to widen awareness of e-government use by citizens; however, subsequent use of these services was limited (Cross, 2007). Accordingly, Carter and Weerakkody (2008) identified the most important factors that affect the adoption of e-government by citizens in the UK, and compared it with the

factors that influence the adoption of e-government by citizens in the USA, whilst taking into consideration cultural differences across nations. 260 participants took part in the London study, which investigated the variables of trust, relative advantage and ICT divides, together with their influence upon the adoption of e-government. Although there were considerable similarities between the US and the UK, citizens' cultural aspects that included individualism, power, masculinity, virtue and uncertainty were noticeable between the two groups of citizens (Hofstede, 2003). Research findings revealed similar, yet significant influencing factors relating to trust and relative advantages, whilst digital divides were insignificant factors in the UK, which were contrary to the result in the US. It was suggested by the researchers that the result was due to the cultural differences between the two countries, because ethnicity is the major digital divide in the U.S., unlike the UK. It was suggested by the study, that in order to achieve a more accurate cultural comparison of e-government adoption, that additional constructs should be included, as well as extending the sample in future research.

The previous literature concerning the adoption of e-government from citizens prospective mainly utilised TAM and DOI models to identify the catalyst factors. The prior researches suggested that the core variables of the TAM were significant predictors of the adoption as well as compatibility variables in DOI and social influence in the TRA, TPB and UTAUT. However, prior works were mainly studying single application of e-government such as taxpaying and surveyed a limited sample such as university student which intend to ameliorate in this study. The social, psychological, technical and personal characteristics' variables that influence citizens' behaviour when adopting e-government services were discussed in the previous section by reviewing previous theoretical literature.

However, it was noticeable from the literature, that cultural context factors those moderate citizens' intentions to adopt and use e-government was neglected on the previous research. Therefore, socio- cultural difference will be discussed in the following section in order to identify the salient factors influence the adoption of e-government among the citizens and develop appropriate hypotheses for the specific research area.

Table 4.1 below summarises citizens' adoption of e-government research, based upon various theories.

Study	Research Place	Base Models	Factor/ Constructs	Sample
Carter and Belanger (2004)	USA	(DOI)	Compatibility and Image, Relative advantages	140 Student
Carter and Belanger (2005)	USA	(DOI)+(TAM) + Web Trust	Perceived Ease of Use, Trust, Perceived Usefulness,	140 Student
Warkentin et al. (2002)	USA	TPB	Trust	1,000 taxpaying citizens in several nations,
Dimitrova and Chen (2006)	USA	(TAM)+(DOI)	Perceived usefulness, Perceived Uncertainty, Interpersonal communication and mass media channels, Civic Mindedness	447 web-based survey
Horst et al. (2007)	Netherlands	(TPB)+(TAM)	Perceived usefulness, personal experiences, subjective norm, perceived behaviour control, risk perception and trust	238 a convenience sample
Van Dijk et al. (2008)	Netherlands	UTAUT	Internet availability, knowledge of availability, digital channel preference and skill and experience of the technology	1225 a random sample e-mail (n=800), telephone (n=416),
Kumar et al. (2007)	Canada	TAM	Characteristics of the user, Website design and Service quality	
Shareef et al. (2011)	Canada	(TAM)+(DOI) + (TPB)	Resource availability, perceived information quality, perceived awareness, perceived trust, perceived image, computer self-efficacy and multilingual options	239 four cities in Ontario, Canada
Gilbert and Balestrini (2004)	UK	Attitude - based and Service - quality -based	Perceived barriers and perceived relative advantage	111 Stratified random sampling in Guildford
(Choudrie and Dwivedi, 2005)	UK	E-government awareness and demographic variables	Age, gender, social class, education and availability of home internet	358 People Finder database

Carter and Weerakkody, (2008)	UK	(TAM)+ (DOI) + Trust	Relative advantages and trust	260 North West London
Lean et al. (2009)	Malaysia	(TAM)+ (DOI) + Trust Model	Perceived relative advantage, perceived usefulness, trust and perceived image	195 Malaysia citizen who work in northern region of Malaysia
Hung et al. (2006)	Taiwan	(TPB)	Perceived usefulness, perceived risk, ease of use, compatibility, external influence, self-efficacy, interpersonal influence, trust and facilitating conditions	1099 Online taxpayers
Doong et al. (2010)	Taiwan	Psychological traits	Citizen's innovative cognitive style and involvement	206 e-housekeeper users
Wangpipatwong et al. (2008)	Thailand	(TAM)	Computer self-efficacy perceived usefulness, and perceived ease of use	614web-based survey with a probability list-based method,
Lin et al. (2011)	Gambia	(TAM)	Information Quality (IQ) perceived usefulness and perceived ease of use	167 E-Government users in Gambia.
Yonazi et al. (2010)	Tanzania		Perceived organisational preparedness, intrinsic service issues, citizen's preparedness, access limitation and organisational context	Case study  Three government Departments
Akman et al. (2005)	Turkey	Demographic variables	Gender and Education	83judgement sampling
AlAwadhi and Morris (2008)	Kuwait	UTAUT	Performance expectancy, peer influence effort expectancy, facilitating condition and behaviour intention	880 Undergraduate students
Al-Shafi and Weerakkody (2009)	Qatar	UTAUT	Performance expectancy, social influence and effort expectancy.	250 Undergraduate students

**Table: 4.1: Theoretical researches relating to the adoption of e-government by citizens.**

## **E-government adoption: socio-cultural characteristics**

The adoption by citizens of e-government, as well as of information technology systems across society generally, is strongly influenced by differences of national culture (Venkatesh and Zhang, 2010; Arslan, 2009; Carter and Weerakkody, 2008; Al-Gahtani et al., 2007). When the design and reality of e-government implementation are revealed to be mismatched in developing countries, Heeks (2003) explains that this often leads to its failure. E-government adoption can also be weakened when the unique social context and national culture of a developing country are ignored by foreign experts employed to introduce this technology, and so this reliance on external expertise results in a gap in practice (Ali et al., 2009). In addition, innovators of technology normally design their products so that they are compatible with their own socio-cultural characteristics normally present in developed countries, which is representative of most technological advances. According to Hill et al. (1998), as a result of cultural and social differences in developing countries, a gap is generated by this bias when new technology is applied. This negative factor can be overcome to improve the adoption of new technology by greater understanding of cultural values and how they influence behaviour, so that new forms of technology will be more likely to be adopted and accepted (Venkatesh and Zhang, 2010).

The environment of a society could be formed by belief or personal faith that is defined as culture (Schein, 1985). Hofstede (1980; p. 24) argues that “culture is the collective programming of the human mind that distinguishes the members of one human group from those of another, culture in this sense, is a system of collectively held values”. Hofstede suggested that there were five dimensions that could be used to define the concept of national culture: Masculinity/Femininity, Collectivism/Individualism, Power distance, Long-term orientation, and Uncertainty avoidance. However, other researchers have criticised this model to evaluate cultural differences, despite its wide adoption since Hofstede’s findings were published, as it has been suggested that results from data collection could be moderated by the model (Chanchani & Theivanathampillai, 2002), criticisms of the culture model as being based on an unjustified set of assumptions, and poor methodology (McSweeney, 2002). Although the classifications presented by the Hofstede model (1980) have been widely adopted across the world, others continue to challenge this, such as Ford et al. (2003), who argued that it was based on an assumption that culture was homogenous, and that cultural values were fixed over time, which disregarded cultural pluralism.

According to Erumban and Jong (2007), the adoption of new innovations is often prevented when countries have a centralised management style, demonstrate individual decision making, have lower openness for new ideas and are often highly dependent on their leaders, which is defined as high power distance index (PDI), where the distribution of hierarchy or power is unequal. Hofstede (2001) described Saudi Arabia as having a high power distance value of 80, which would have a negative influence, but if new technology could have its value proven to other citizens, then individual citizens living in a country with a high PDI value could be encouraged to use this technology.

Hofstede (2001; p.83) defines uncertainty avoidance index (UAI) as “the degree to which members of a society feel uncomfortable with uncertainty and ambiguity.” Arslan (2009) supports these findings and explains that the adoption of new technology is affected when people feel uncomfortable due to unstructured or new situations, or they are uncertain when using applications, so that virtual transactions require trust. Hofstede (2001) defined Saudi Arabia as having a UAI score of 68, which when compared to other countries, is considered to be high, and previous findings have supported this high score for Arab countries, as face-to-face interaction is normally preferred.

The individualism index (IDV) is the measurement applied to societies to determine how citizens integrate within society and how they relate to other groups. According to Erumban and Jong (2007), in individualist societies, citizens would normally make their own choices and decisions, which is in contrast to collectivist societies, as these citizens are normally influenced strongly by the norms and ideas of their society. Therefore, the values and norms of collectivist societies often conflict with new technology, but there is a greater willingness by citizens to express views and adopt new innovations more readily in individualist societies. Hofstede (2001) described Saudi Arabia as having a low individualism index score of 38 when compared to other countries, so society in Saudi Arabia could be described as having a cohesive network where interdependence is demonstrated.

According to Hofstede (2001), quality of life, maintaining warm personal relationships, service, caring and solidarity would define feminine values, but assertiveness, performance, success and competition would define masculine values. Arslan (2009) and Erumban and Jong (2007) suggest that rewards for individuals that enhance personal training and development, as well as recognition would define masculinity, so that there

would be an emphasis of innovation adoption, when separating the emotional roles of genders. According to Bahchi et al. (2003, p. 960), “IT promotes more cooperation at work, better quality of life and these values are espoused in nations with low Masculinity (MF) index.” Hofstede (2001) defined Saudi Arabia as having a masculinity score of 52, which, when compared to other countries, would be described as average, as women have a lower involvement in society and are highly dependent on men due to religious customs. Arab culture is defined by Nelson (1993) as male dominated, but this is challenged by Abu-Lughod (1990), who argues that women have an independent lifestyle, and that the separation of genders is now uniquely associated with Arab society.

Hofstede (2001) described future rewards and dynamic progression that are achieved by thrift and perseverance would be to define long-term orientation of a society, but a static orientation presented by an adherence to traditions, both past and present, would be to define short-term orientation. These concepts are supported by Arslan (2009) and Erumban and Jong (2007) who explain that new innovations are unlikely to be used or accepted when societies are traditional and conservative, or when the need to fulfil social obligations is strongly valued. Therefore, as Saudi Arabia is described as a society that strongly adheres to traditions and religion, there is no measurement of its long-term orientation value.

Saudi Arabia is described by Hofstede (2001) as scoring an average of four cultural dimensions, which demonstrates a typical example for Arab countries.

Country	Power Distance	Individualism	Masculinity	Uncertainty Avoidance	Long-term Orientation
<u>Arab</u>	80	38	52	68	
<u>World</u>					

Table 4.2: Arab world cultural dimensions (Hofstede, 2001).

According to Hall (1966, p. 173 cited in Hall, 1973), Arab countries present a "polychronic culture that tends to view problems in a more holistic fashion and ... work on all components simultaneously". In Arab countries events often occur without planning, which is defined as a static phenomenon of sense of time, which is a critical influencing factor of their culture. The cultural characteristics of Saudi Arabia could encourage its citizens to adopt new technology, as e-government services can be accessed at any time or from any location, which offers flexibility.



Research findings suggest that systems outcomes are affected by national infrastructure and policies, technological curation and culture-specific beliefs that are defined in a culture influence model developed by Hill et al. (1994). These findings suggest that cultural beliefs of Arab societies predict resistance to adopting information systems (Hill et al., 1998; Straub et al., 2001). This is challenged by Loch et al. (2003), who argue that the adoption of the Internet in Arab countries is affected by the fact that technology was developed originally in developed countries, where the experiences of individuals in society and their cultural exposure is different in terms of degree of technological curation and social norms.

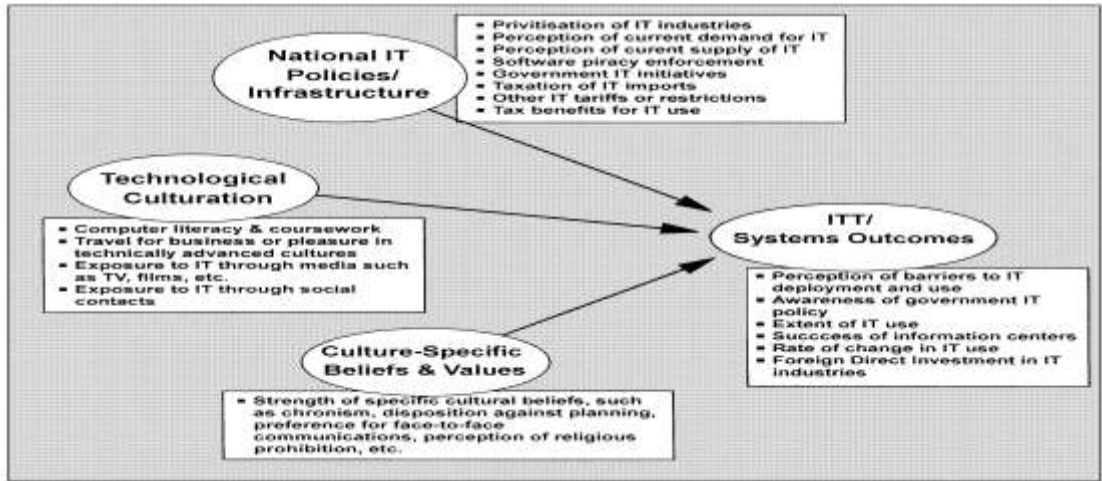


Figure 4.8: IT Transfer and cultural influence modelling (Straub et al., 2001; Hill et al., 1994)

Fatalism was described by Patai (1973) as a strong characteristic of Arab society, but this finding has been criticised by others, who have defined Arab culture as contradictory and complex, so that the dominant trait is conflicting value orientation (Barakat, 1993). These conflict values include vertical versus horizontal values, charity versus justice, obedience versus rebellion, open versus closed mindedness, collectivity versus individuality, culture of the mind versus culture of the heart, past oriented versus future oriented and conformity versus creativity.

Factors that define the society and culture of Arab countries are described by Barakat (1993) as including:

- Dimensions of social class cleavages, assimilation/accommodation conflict, and heterogeneity/homogeneity continuum contribute to the factor of social diversity,
- Socio-economic levels defining the factor of pyramidal class structure,

- Religious adherence and the positive relationship network between families and social networks that define the factor of social inter-dependency,
- Perpetual change that is presented by Arab societies that defines the factor of transition and Arab renaissance,
- Society demonstrates the factor of patriarchal relationships,
- Primary group relations factor,
- Social interactions that demonstrate the factor of expressiveness and spontaneity,
- Arab cultures lack a civil society and demonstrate alienation, and
- Underdevelopment and continuing dependency factors.

Gefen and Straub (1997) argue that between the genders, there is agreement to adopt the use of new technology, so that despite previous perceptions of gender in Arab societies, gender could be included as a cultural variable in the IT diffusion model. These findings are challenged by Srite and Karahanna (2006), who argue that intended behaviour is affected by the factor of social norms influenced by uncertainty avoidance cultural values and femininity values. These findings suggested that the association of perceived behaviour intention and usefulness strongly affected the correlation between ease of use and behaviour intention, but were not affected by moderating value of masculinity/femininity.

A study in Saudi Arabia used desktop computer applications to investigate technology acceptance by considering the cultural dimension of the country when applying UTAUT, and Al-Gahtani et al. (2007) found that subjective norm with the intention to use the technology and performance expectancy demonstrated a correlation that was significant, which differed from the results obtained in the USA. However, these findings did not discover any correlation between effort expectancy with facilitating conditions and intention to use with the actual use of the technology. These findings indicated that high power distance as a cultural dimension encourage individuals to prove their abilities to their leaders, and that strong correlation between subjective norm and behaviour intentions to use technology were defined by low value of individuality.

Another study applied UTAUT to various cultures, and found that intention to use technology was affected by social influence, so that findings from China and the USA were different (Venkatesh and Zhang, 2010).

However, the review of literature reveals insufficient findings relating to cultural factors influencing the adoption of e-government, although two studies compared two different cultures, and revealed the potential influence of cultural differences between the UK and Sri Lanka (Ali et al., 2009) and between the USA and the UK (Carter and Weerakkody, 2008). In a study of European countries, cross-cultural adoption of e-government was evaluated by Arslan (2009), and in a study of global e-government readiness, Khalil (2011) and Kovačić (2005) evaluated the impact of national cultures. Another study by Zhao (2011) undertook a comparison of Hofstede's five cultural dimensions across the world with e-government development.

In a study in Malaysia, Seng et al. (2010) applied an anthropological framework based on the Douglas Grid and Group Cultural Theory that evaluated the cultural enablers and barriers that affected e-government development in the country. Two case studies of Malaysian organisations led to the presentation of four cultural cosmologies being presented that affected e-government implementation: fatalism, individualism, egalitarianism and hierarchism. Chatfield and Alhujran (2009) compared e-government websites across Arab countries, and their analysis revealed a digital divide between developed and Arab countries, as well as between Arab countries. However, these studies often failed to consider how Arab culture could influence citizens to adopt e-government services by emphasis on single socio-culture case, and this current research will attempt to fill this gap in the literature by studying how the culture of Saudi Arabia could affect the adoption of e-government in the country, and to propose a conceptual model that would take account of relevant socio-cultural constructs.

The cultural characteristics of the country were investigated in order to support the researcher to identify factors that influence the adoption of e-government in Saudi Arabia. The cultural dimension of low individuality and high collectivism was demonstrated on the social influence factor while Trust was included as a variable for this study of Saudi Arabia, because it has high scores for uncertainty avoidance and face-to-face interaction preference cultural values. In addition, adoption of e-government services would be encouraged by the conservative society, gender segregation and the hot climate of Saudi Arabia, but citizens are likely to continue to prefer face-to-face interaction as a cultural preference that cannot be possible with e-government services. Therefore, a compatibility variable was added to UTAUT to identify a personal attitude factor. Culture characteristics of polychronic and lack of sense of time was reflected on the performance expectancy

factor. As e-government services are available online at all times and from any location, this flexibility could be supported by this cultural characteristic to adopt this new technology, as users do not need to use e-services at specific times. High power distance (pyramidal class) is reflected in digital divides problem and facilitating condition factor. In high power distance societies, information is controlled, few people have access to resources, and different groups have different involvement levels in the society (Khalil, 2011).

The review of literature of technology adoption and culture values suggests that low levels of adoption of e-government in developing countries should not be blamed on the culture or individual citizens, but that new technology needs to be adapted to suit the culture of Arab societies to achieve high diffusion of technology (Alsaif, 2013). The following section will examine the cultural dimension within Saudi Arabia to identify factors that could influence the adoption of e-government, select the appropriate based model for the research and then create the working hypotheses for this research.

## **Research Based Theory**

The adoption of technology by users has revealed salient constructs from the review of literature that have been based on UTAUT, TAM, DOI, TPB or TRA, but researchers have also attempted to include more salient variables to explain their findings better by integrating two or more theories. This study will consider the aforementioned socio-cultural value of Saudi Arabia to identify the catalyst factors affect the adoption of e-government in Saudi Arabia and justify the proper based model for the study.

Although, TAM is considered to be a model that is parsimonious, simple and robust, it is based on TRA, which ignores behaviour under volitional control or unconscious behaviour that demonstrates a significant limitation. Therefore, TAM has no simple mechanism to extend the variables due to insufficient determinants of perceived ease of use (PEOU) or perceived usefulness (PU). TAM has also been criticised as it is claimed that it considers acceptance of technology rather than usage behaviour, and ignores emotional choices (Van Dijk et al., 2008). Also, although social norm is validated in TRA, this is ignored in TAM, and effort expectancy and performance expectancy in UTAUT and complexity and relative advantage in DOI are very similar to perceived ease of use (PEOU) and perceived usefulness (PU) in TAM.

Findings suggest that diffusion of technology in DOI is strongly influenced by the main constructs of compatibility, complexity and relative advantage. However, Bradford and Florin (2003) argue that triability and observability as variables in DOI cannot be applied when measuring the adoption of new technology. TPB excludes moderated demographic variables and UTAUT ignores belief mechanisms, but they also demonstrate similarities, such as external control factors, social factors and attitude factors.

According to Al Awadhi and Morris (2008), the suitability, validity and reliability of UTAUT have been proven, as well as its application within different contexts for research studies of technology adoption, despite its relatively recent development. Eight models of psychological theories, diffusion of innovation and technology acceptance were compared to formulate the UTAUT model. Over a six-month period, this model was validated by four different organisations, so that account could be taken of high levels of variance of usage intentions regarding adoption of technology (Venkatesh et al., 2003). Within UTAUT, intentions to use technology are determined by performance expectancy, effort expectancy and social influence. In terms of actual use, this is defined by facilitating conditions, and moderating variables are defined as age, gender, experience and voluntariness of use.

This study has attempted to provide better understanding of the adoption of e-government in Saudi Arabia by analysing more variables from citizens' perspectives. Therefore, the model adopted for this study has been a modified UTAUT model, because it presents suitability, validity and reliability.

UTAUT, TAM, DOI and TPB all include the effects of attitudinal or personal characteristics on technology adoption. As Saudi culture demonstrates low individuality and high collectivism, the social influence factor of UTAUT makes this suitable. TAM and DOI models do not identify facilitating factors, which are recognised within UTAUT, so resource availability, such as time and money, and the critical significance of computer knowledge are important factors that influence technology adoption. As a result of these findings, the researcher modified UTAUT to develop a research model that was more suitable for the research area and for the case study.

This amended UTAUT model identifies Saudi citizens' perspectives towards influencing factors when adopting e-government services. Effort expectancy could be measured by ease of use or complexity of e-government systems, and performance expectancy could be measured by the benefits of time, cost and effort savings. There is agreement from previous studies that performance expectancy, effort expectancy and compatibility are factors that are significant when evaluating the adoption of new technology (Venkatesh et al., 2003; Carter and Belanger, 2005). However, in the case study of Saudi Arabia, compatibility is a significant influencing factor for adoption of e-government systems, because women can access online services despite genders being segregated within society. In addition, adoption of e-government services would be encouraged by the hot climate of Saudi Arabia, but citizens are likely to continue to prefer face-to-face interaction as a cultural preference that cannot be possible with e-government services. Therefore, a compatibility variable was added to UTAUT to identify a personal attitude factor.

Adoption of e-government services in Saudi Arabia can be evaluated by understanding how individuals are influenced by family and friends, as well as other significant people known to them. This demonstrates the importance of social influence in the country, and reflects its collectivist and high power distance dimensions. The review of literature reveals that social influence can be subdivided into external social influence relating to mass media influence, and internal social influence relating to colleagues, friends and family.

The perception of skills and knowledge needed to adopt and use e-government systems, as well as resources required measured the facilitating condition variable. However, compatibility, facilitating conditions and perceived behavioural control form the three root constructs of facilitating condition. Facilitating conditions and perceived behavioural control are constructs that overlap when measuring the factors of technology, knowledge and resources required for technology adoption. Facilitating conditions variables revealed in previous findings suggest that government support and technology support are significant factors (Taylor and Tood, 2005; Hernandez and Mazzon, 2007).

According to Shareef et al. (2011), the quality of e-government systems and the quality of the information they provide are likely to determine citizens' use and adoption of these services. Therefore, the UTAUT model was adapted to include system quality and information quality as facilitators of e-government adoption for this study.

Many individuals are reluctant to carry out virtual transactions online, and this variance of lack of trust hinders new technology adoption for these people. Several researchers have adapted technology acceptance model to include a trust factor, and have reported that adoption of e-government and e-commerce systems are significantly influenced by trust (Warkentin et al., 2002; Gilbert and Balestrini, 2004; Carter and Belanger, 2005). Trust in government was included as a variable for this study of Saudi Arabia, because it has high scores for uncertainty avoidance and face-to-face interaction preference cultural values, so that citizens' trust could be measured. Therefore, trust of the Internet and trust of government agencies were evaluated to measure levels of trust, which could influence citizens' intentions to use and adopt e-government services (Belanger and Carter, 2008).

The adoption process is defined by van Dijk et al. (2008) as four stages of: to know, to persuade, to decide and to confirm. Shareef et al. (2011) suggests that a starting point for adoption could be knowledge or perception of the system, but belief about the system is a more important influencing factor for adoption. Therefore, to present a better prediction of e-government adoption, this study has also included awareness of the system variable to the UTAUT model.

The moderated variables of UTAUT of age, gender, experience and voluntariness of use are used to determine their influence on the main factors considered, but for this study to provide greater suitability, voluntariness of use as a variable has been removed. This adaption of the model is justified as e-government in Saudi Arabia is at an early stage of development and its services are voluntary for citizens, but adoption behaviour is moderated by level of education, so this variable was added to the UTAUT model.

According to Ajzen (1991), the intention to use variable can predict citizens' actual use or adoption of e-government services, but within the UTAUT model, facilitating conditions factors have a direct relationship with actual use of the system (Venkatesh et al., 2003).

## Research Hypothesis Development

This exploratory study intends to develop a conceptual model for the adoption of e-government services in Saudi Arabia by considering the impact of socio-cultural factors on models and theories developed for adoption of technology based on the working hypothesis.

### Awareness of the system

In developing countries, e-government systems are mostly at early stages of implementation, and are considered a new phenomenon (Norris and Moon, 2005). Therefore, before citizens can decide whether or not to adopt and use new technology, they need to become aware of the existence, disadvantages, safety, functionality and benefits of the e-government services of the public sector (Kunstelj et al., 2007; Van Dijk et al., 2008; Verdegem and Verleye, 2009; Shareef et al., 2011). An individual's intention to adopt and use new technology is affected by their attitudes or personal beliefs that have been already identified as determinants of use in both TPB and TRA. Personal belief is more likely to be developed if citizens are aware of e-government systems when they are initially launched. However, raising awareness of the system through interpersonal communication is less successful than mass media channels during early stages of implementation of e-government (Rogers, 1995, 2003; Dimitrova and Chen, 2006). Based on these findings, these hypotheses are presented:

**H1:** *Behavioural intentions to adopt e-government services in Saudi Arabia are affected significantly by awareness of the system.*

**H1a:** *At the early stage of implementation, interpersonal communication is less important than mass media channels to learn about e-government.*

### Compatibility

The belief of an individual that the adoption of new technology is compatible with their cultural values and lifestyle is defined within diffusion of innovation theory (DOI) as compatibility (Rogers, 1995). The dissemination of new systems within society is fostered by compatibility that has been defined as a critical variable (Rogers, 2003). In another study of online tax returns and payment in Taiwan, Huang et al. (2006) found that user acceptance was determined by compatibility, as an important predictor, and Shareef et al. (2011) suggests that when considering social norms and face-to-face preference, aspects of behaviour, society and culture are important elements of the compatibility factor.



However, compatibility of e-government adoption through online services for females in Saudi society is fostered by their normally limited access to services and general segregation of gender, which contrasts to normal preference for face-to-face services within these societies (Siddiqui, 2008). Based on these findings, these hypotheses are presented:

**H2:** *Behavioural intentions to adopt e-government services in Saudi Arabia are affected significantly by compatibility.*

**H2a:** *Gender moderates the influence of compatibility toward the intention to use e-government behavior in Saudi Arabia.*

## **Social influence**

In previous studies, changing attitudes towards e-government services have revealed influence of society as a critically important factor that influences personal belief. The degree of the perception of an individual that others believe that they should use new systems defines the level of social influence (Venkatesh et al., 2003). This factor is defined differently with different models, so that in UTAUT it is social influence, in DOI it is image, in MPCU it is social factors and in TPB and TRA it is subjective norm. The intention to adopt e-government from perceived usefulness of e-services is affected by subjective norm (Horst et al., 2007). In a study in Qatar on e-government adoption, Al-Shafi and Weerakkody (2009) confirmed the importance of social influence effects and in another study in Kuwait of student adoption of e-government, Al Awadhi and Morris (2008) found that this was largely determined by peer influence. This demonstrates that individual decisions are affected by social influence determined by culture. Karahanna (2006) suggests that intended behaviour is determined by the social norm factor that is determined by uncertainty avoidance and high femininity cultural values, and other studies report that countries that have been less successful in encouraging their citizens to adopt e-services often demonstrate a society that has high power distance and high collectivist cultural values (Erumban and Jong, 2007; Arslan, 2009). In this study, Saudi Arabia has been shown to demonstrate high power distance, low individualism and high uncertainty value dimensions, so that citizens generally respect the ideas and opinions of others. Therefore, individual behaviour towards social attitudes is affected by social norm and collective opinion.

Social influence could also be moderated by gender, as females demonstrate more sensitivity to other opinions, as well as the factor of age, as younger citizens would be more likely to copy the behaviour of others. This contrast with individuals with lower levels of education or those with less experience of using the Internet who tends to follow the norm at an early stage (Al-Gahtani et al., 2007; Venkatesh and Zhang, 2010). Therefore, the following hypotheses are presented:

**H3:** *Intention to use e-government systems in Saudi Arabia is affected significantly by social influence.*

**H3a:** *Gender will moderate the social influence toward the intentions to use e-government service in Saudi Arabia.*

**H3b:** *Age will negatively moderate the social influence toward the intentions to use e-government service in Saudi Arabia.*

**H3c:** *Experience will negatively moderate the social influence toward the intentions to use e-government service in Saudi Arabia.*

**H3d:** *level of education will negatively moderate the social influence toward the intentions to use e-government service in Saudi Arabia.*

## **Performance expectancy**

It is postulated by the Unified Theory of Acceptance and Use of Technology (UTAUT) that performance expectancy and effort expectancy are critical constructs that have an impact upon attitudes towards the adoption of technology.

The definition of performance expectancy is the degree that an individual believes that using the system will help to achieve job performance gains (Venkatesh et al., 2003). The definition of effort expectancy is the degree of ease associated with the use of a system (Venkatesh et al., 2003, p. 450). The salient role of perceived usefulness and perceived ease of use to determine individual attitudes to use e-government systems was affirmed by Carter and Belanger (2005), Hung et al. (2006), Wangpipatwong et al. (2008) and Lin et al. (2011).

A number of other researchers, including Carter and Blenger (2004) and Agarwal and Prasad (1997) failed to find any significant relationship between these constructs relating to the adoption of e-government. It was commented by Shareef et al. (2011) that inclusion of compatible variables taken from other theories might hinder the effect of other included variables. One example quoted is the Performance Expectancy factor, which is based upon

perceived usefulness (TAM/TAM2 and C-TAM-TPB), extrinsic motivation (MM), job-fit (MPCU), relative advantage (IDT), and outcome expectations (SCT). However, effort expectancy, which is based upon perceived ease of use (TAM) complexity (MPCU), and ease of use (IDT).

The relative advantages in DOI, perceived usefulness in TAM or performance expectancy in UTAUT are effective in measuring the gains that users achieved by using electronic transactions when compared to traditional transactions. Timesaving, cost savings, convenience, greater efficiency and accessibility at any time and from anywhere are all benefits that are commented upon by Shareef et al. (2011).

The culture of Arab countries could encourage its citizens to adopt e-government, as it offers better flexibility, which supports the defining factors of sense of time and planning constraints. Performance expectancy is a strong variable that can predict intention to use new technology (Alawadhi and Morris, 2008; Venkatesh et al., 2003; Al-Shafi and Weerakkody, 2010). This is particularly relevant in Saudi Arabia, because men are more focused on achievement than women, as men have more dominant social roles. This is challenged by Venkatesh and Zhang (2010), who suggest that a more important variable is effort expectancy, as at the stages of early experience, this has an influence on adoption of technology by women. As a result, the following hypotheses are proposed:

**H4:** *Behavioural intentions to use e-government services in Saudi Arabia will be significantly affected by performance expectancy.*

**H4a:** *The influence of performance expectancy upon the behavioural intentions to use e-government service in Saudi Arabia will be moderated by gender.*

### **Effort expectancy**

DOI complexity, perceived ease of use in TAM and effort expectancy in UTAUT encapsulates perceptions of previous experiences of ICT usage and the ability of individuals to use it. These factors are considered as potential indicators of the acceptance and adoption of e-government and, as Rogers (2003) commented, the degree to which an innovation is perceived as difficult to understand and use is regarded as complexity.

Agarwal and Prasad (1997) argued that a system that has high visibility has complexity ignored. TAM considers that perceived usefulness is impacted by perceived ease of use, because the system that is less complex will be more useful (Wangpipatwong et al., 2008).

Venkatesh and Zhang (2010) consider that effort expectancy is a stronger variable, which has an impact upon women's adoption of technology during the early experience stages. Therefore the following hypotheses are proposed:

**H5:** *The intention to use e-government services in Saudi Arabia will be significantly affected by effort expectancy.*

**H5a:** *The influence of effort expectancy towards the intention to use e-government services in Saudi Arabia will be moderated by gender.*

**H5b:** *The influence of effort expectancy towards the intention to use e-government services in Saudi Arabia will be negatively moderated by internet experience.*

## **Trust**

A number of researchers have commented that citizens remain reluctant to adopt e-government due to factors of trust and privacy, as well as security concerns (Belanger and Carter, 2008). Rotter (1971) defined trust as an expectancy that individual or group can be relied upon. A USA survey carried out by GAO (2001), demonstrated that despite American citizens belief in the benefits of e-government, they remain concerned about risks associated with online transactions, together with the electronic sharing of their personal information.

The influence of trust on e-government adoption was studied by Warkentin et al. (2002), who found that characteristics-based trust, institutional-based trust and process-based trust would affect personal behaviour when adopting e-government. Trust in e-government is classified by Lean et al. (2009) as institutional trust that depends upon a third party to regulate and guarantee services, such as implementing electronic certificates, as well as interpersonal trust that is related to the skills, ability and experience of the provider to satisfy the needs of citizens.

Lean et al. (2009) claimed that perceived privacy, perceived non-repudiation and perceived authentication as affecting the trust towards increased intentions to use e-government were claimed by Lean et al. (2009), whilst Shareef et al. (2011) considered that perceived uncertainty, perceived privacy and perceived security influence the trust in the adoption of e-government. In a model of trust and risk perception in e-government adoption determined by Belanger and Carter (2008), both trust and individual confidence were found to affect personal willingness to adopt e-government.

The fundamental factors that affect trust are trust of the Internet that is linked to the belief of citizens that the Internet is a dependable medium, as well as a safe place to perform secure transactions, together with trust of organisations that is associated with a belief in the capability of agencies, as well as the ability of staff to provide online services in a confidential manner. George (2002) considered that concerns relating to risks involved in the adoption of technology increased as the experience of the Internet decreased. Within Saudi Arabia, the culture value of uncertainty is relatively high, which will require additional effort to encourage confidence and trust between all members of society; it is the people with more internet experience who have greater confidence in using on-line services. The following hypotheses are therefore presented:

**H6:** *Intention to use e-government services in Saudi Arabia will be significantly influenced by trust in the Internet*

**H6a:** *Experience of the internet will moderate the influence of trust towards the behavioral intention to use e-government services in Saudi Arabia.*

**H7:** *Intention to use e-government services in Saudi Arabia will be significantly influenced by trust of the Government.*

### **Behavioural intention**

Behaviour is considered to be a dependent variable in the previous hypotheses and refers to “the person’s subjective probability that he or she will perform the behaviour in question” (Fishbein and Ajzen, 1975; p. 288). The intention to utilise behaviour includes the prediction and intentions of citizens to use e-government systems in the future. Earlier literature revealed that intention to use behaviour has a significant positive influence upon on the usage behaviour (Venkatesh et al., 2003; Ajzen, 1991) and this study sought to verify this hypothesis among Saudi’s citizens. Therefore, the following hypothesis is re-proposed.

**H8:** *Behavioural intention will significantly influence usage behaviour.*

### **Computer self-efficacy and resource availability**

The availability of resources, together with knowledge of the service are primary factors that influence the adoption of e-government, because citizens will adhere to traditional government facilities unless they are provided with the correct resources and knowledge to use these resources (Van Dijk et al., 2008). These factors are referred to as computer self-efficacy and facilitating condition by Huang et al. (2006), who consider them to be the primary determinates of online tax filing and payment system adoption in Taiwan.

Computer self-efficacy is considered by Wangpipatwong et al. (2008) as a fundamental factor that affects the adoption of e-government. Perceived behaviour control that affects an individual's intention to use is based upon TPB computer self-efficacy and facilitating condition. Compeau and Higgins (1995) comment that self-efficacy is an individual's self-confidence their own ability to fulfil a certain behaviour. Such a definition is related to the concept of self-efficacy that was introduced by Bandura (1986; p. 391) as "people's judgments of their capabilities to organise and execute courses of action required to attain designated types of performances. It is concerned not only with the skills one has but with judgments of what one can do with whatever skill one possesses".

The resources that are needed to engage in certain behaviour are represented by facilitating conditions (Triandis, 1971). Van Dijk et al. (2008) commented that both knowledge and availability of the required resources are essential prerequisites when adopting an e-government system. The availability of the resources, together with the skills required to make use of the technology are considered to be digital divides that hinder the adoption of e-government, which is a problem in many developing countries (Shareef et al., 2011). The writers comment that the availability of resources creates a belief of using e-government, which constructs an attitude to use the system.

Al-Shehry et al. (2006) commented that the challenge of digital divides in Saudi Arabia have a negative impact upon the implementation of a system of e-government. In addition, power and status within the dimensions of Saudi culture confirm this finding. The availability of resources is another factor that has become an insignificant variable towards behavioural intentions if performance expectancy and effort expectancy were included within the same module (Venkatesh et al., 2003). The following hypotheses are proposed:

**H9:** *A significant influence on e-government usage behaviour will be predicted by computer self-efficacy.*

**H9a:** *The influence of computer-self efficacy toward e-government adoption in Saudi Arabia will be moderated by internet's experience.*

**H10:** *E-government adoption will be significantly influenced by the availability of resources.*

## Quality of Information

Kim et al. (2005) comment that the satisfaction of users could be directly predicted by their expectations before using the service, and perceptions of quality after they use the service. High user satisfaction levels could increase the adoption rate of e-government (Kumar et al., 2007). The literature comprises two oriented views about the websites quality which are customers' expectation and standard to be met (Connolly and Bannister, 2007); technical and users view (Qutaishatal, 2012). The technical view holders argue that the users' acceptance of the website is based on the features of the system which includes usability, accurate information and transaction security (Palmer, 2002; Park and Kim, 2003). Whereas the users view holders claimed that the quality is associated with a characteristic of a product or service to reflect how well it meets the customer's needs and their expectation (Long and McMellon, 2004). Consequently integrated approach of both technical and users views may result in more effective website quality and embraces e-service quality which relates to both system quality, as well as information quality. Information quality was defined by DeLone and McLean (1992, 2003) as quality that results in a system's overall performance, and measured by the perceptions of individuals. The quality of information is associated with the relevancy, accuracy, integration, current and completeness of information shared on government websites that influence citizens to use the service (Shareef et al., 2011). On the other hand, (Lin, 2007) defined the information quality as how individual perceives the value of the output which produced by the website and could be measured by the informativeness and security. The quality of information is thought of as a predictor of the satisfaction of users, as well as the success of the information system that will eventually lead to the adoption of the system (DeLone and McLean, 2003; Connolly and Bannister, 2007). Stiftung (2002) reported that one of the leading governmental e-services, Canada, based its strategy upon the perspectives of likely users. Such a strategy determines the online presentation, as well as how the information is organised and delivered to citizens. Therefore, it is very important that the needs of society are clearly understood and the services tailored accordingly to meet those needs. This study adopts the information quality from (Shareef et al., 2011) and the following hypothesis is proposed:

**H11:** *E-government adoption will be significantly influenced by the quality of information presented.*

## System quality

An additional service quality that affects the satisfaction of users towards e-government adoption is system quality, which refers to system performance, functionality, customer service and continuation of service (Lee & Rao, 2003; Shareef et al., 2007). “System quality represents the quality of the information system processing itself” (Chen, 2010). It is claimed by Dabholkar (1996) that delivery speed, reliability, ease of use, control and enjoyment were all significant factors when determining expected system quality while (Lin, 2007) argues that system quality is measured by website design and interactivity. The regular maintenance of the system in order to reduce system down time will also enhance the satisfaction of citizens and encourage adoption of the service. The lack of physical interaction in e-services necessitates customer services that respond promptly and sympathetically to questions and requests from users (Shareef et al., 2011). A variety of services may be offered to deal with user requests, including emails, blog and live chat facilities in order to encourage citizens to use e-services. The following hypothesis is presented:

**H12:** *E-government usage behaviour is influenced significantly by system quality.*

## Proposed Research Model

Based upon on the model and theories of technology acceptance discussed previously, as well as relying upon the core model of UTAUT, the following conceptual model is developed. The cultural aspects relating to Saudi Arabia that have been previously discussed are taken in account within this multidisciplinary model. The left hand side of the model comprises the salient factors that affect the intention to use behaviour, whilst the right hand side refers to the catalyst factors that influence the direct use and adoption of e-government. Some relationships between variables were neglected because there is no clear evidence on the base model, prior literature or the culture context of influence between these variables such as gender x awareness, or age x trust . Self-efficacy and effort expectancy are proposed to affect different dependent variables in order to reduce the multicollenerity between these constructs.

Various trust factors are included within the model that affect the intention to use e-government, whilst the lower side of the model indicates the moderated variables that affect the main factors. Behaviour dependent variables are associated with the core attitudinal factors in the UTAUT, which are effort expectancy and performance expectancy, as well as the social influence factor.



This model is extended to involve the compatibility and awareness of the system as well as factors relating to trust independence. Direct use behaviour (dependent variable) is correlated with the facilitating conditions factor (independent variable) in the original UTAUT. This factor was split into computer self-efficacy, availability of resources, information quality and system quality variables.

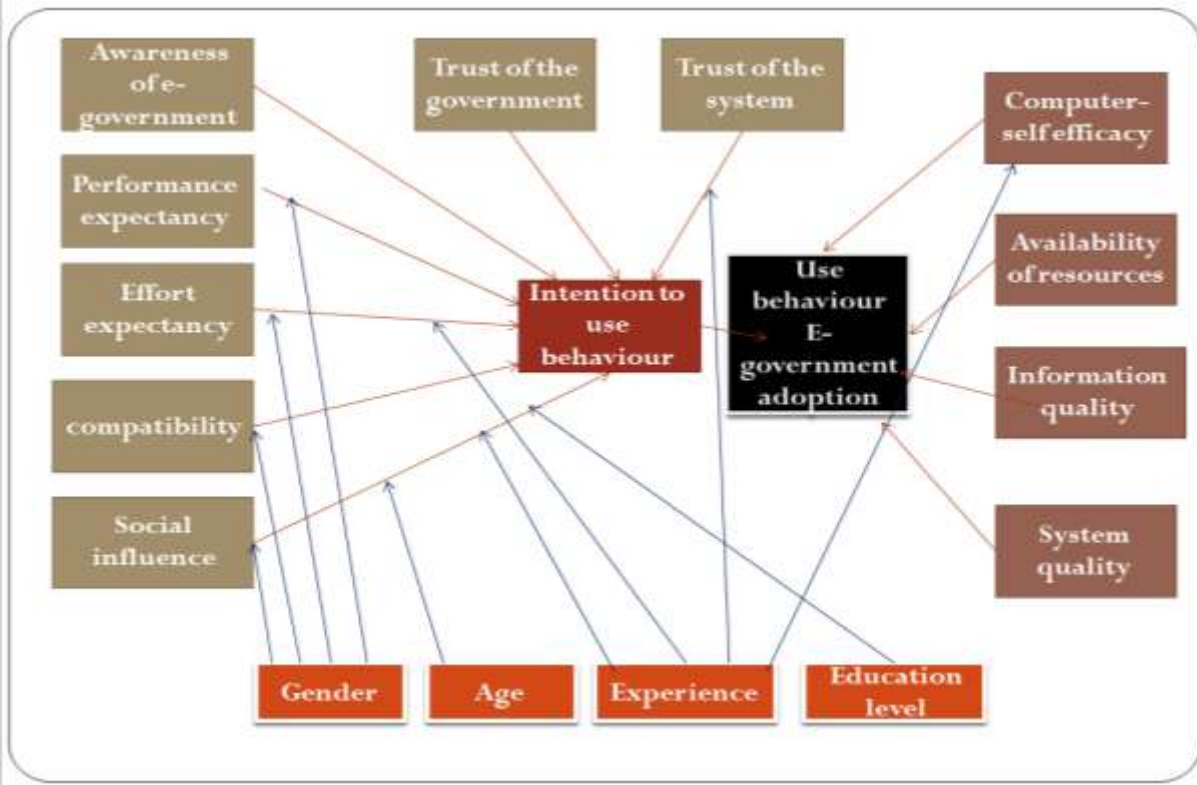


Figure 4.9: Proposed model of the adoption of e-government in Saudi Arabia.

## Conclusion

A variety of common theories and models that influence citizen's adoption of new phenomena have been examined in this chapter. The Theory of Reasoned Action (TRA) and Theory of Planned Behaviour (TPB) considered psychological and human behaviour, and how individual attitude is affected by personal belief. Both the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) have focused upon technology acceptance as an ultimate target for the models, as well as the influence of perceived usefulness and ease of use towards personal intention to use the technology. In addition, the Diffusion of Innovation Theory (DOI), Model of PC Utilisation (MPCU), Motivation Model (MM), Model of Trust and Risk and Social Cognitive Theory (SCT) in e-government adoption have been discussed in this chapter in order to investigate the catalyst variables that have an impact upon citizens' adoption of e-government.

This chapter has also reviewed the earlier literature about citizen's adoption of e-government that is primarily focussed upon earlier theories of adoption. Agreement was forthcoming in the literature relating to the role of culture difference when shaping factors that influence citizens' adoption of technology. There was little reference to the socio-cultural variables in the previous research as salient factors that have an impact upon citizen's adoption of technology.

It is the intention of this study to fill the gap by considering the cultural dimensions within Saudi Arabia when developing the research hypotheses. The complicated characteristics of the Arab culture include collectivism, power distance, diversity, uncertainty avoidance and the religious adherence which impact upon all aspect of the Arab life style, and are the main characteristics of the Arab world, in general, and Saudi society, in particular, which are considered as resistance variables to the adoption of technology.

Finally, this study has developed a conceptual model that includes social, technical, demographics, cultural constructs and behaviour that affect the adoption of e-government by Saudi citizens, and is one of the key objectives of this empirical research.

# Chapter 5:

## Design of the Research

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### **Introduction**

In architecture, it is necessary to determine the type and use of a building, together with the needs of the occupants, before ordering the materials and commencing with the construction. Correspondingly, projects that are related to social research require both a research design and a procedural design structure before the data collection process and subsequent analytical processes can commence. Research design is defined by Cresswell (2009; p.3) as "plans and the procedures for research that span the decisions from broad assumptions to detailed methods of data collection and analysis". Ensuring that the evidence obtained enables the initial questions to be answered as clearly as possible is the purpose of research design. Specifying the type of evidence required to answer the research questions, the testing of theories, evaluation of the programme and description of phenomena are all part of the relevant evidence that is required in research design. This chapter examines how previous literature is collected, identifies the purpose of the research, specifies the philosophy of the research, examines the approach to the research, designs the method of the research, defines the research strategy, identifies the research sample, as well as determining the method for data collection. In addition, the design of the questionnaire, survey pre-test and piloting, validity and reliability checking of the research, as well as maintaining ethical issues throughout the duration of the research are discussed in this chapter.

### **Systematic review of the literature**

The non-empirical research is included in this study, which could be addressed throughout the literature review. One of the research questions to be answered concerns the identification of research evidence that relate to factors that constrain, as well as promote the implementation of e-government. A second research question proposal examines the most appropriate theoretical model to analyse the adoption of e-government by citizens. Therefore, this study both examines and considers previous literature written about the subject carefully.

A review of literature is an essential part of the research for any study, because it assists researchers to establish a comprehensive knowledge about the area of study. In addition, a review of the literature helps researchers to identify gaps in previous studies, based upon a theoretical foundation. The literature review also contributes to the framing of the methodology of the research, the field and knowledge of the study, as well as the proposed objectives and research question (Levy and Ellis, 2006).

Some research lacks a structured and reliable literature review to a standard that is dependable. Systemic literature may be defined as "a replicable, scientific and transparent process... that aims to minimise bias through exhaustive literature searches of published and unpublished studies and by providing an audit trail of the reviewer's decisions, procedures and conditions" (Tranfield et al., 2003: p.209). A systematic literature review also has advantages and disadvantages. Opportunities within the systematic literature review process help to avoid possible bias within the studies selected, as well as providing a full awareness of the available literature. There are limitations within a systematic literature review, because research questions could have open and flexible boundaries or could be insufficiently defined. This approach is also criticised because of the apparent bureaucratisation of the reviewing process, which may focus upon the technical aspects and process, rather than analysing and interpreting the subject. Bryman (2008) considers that the evaluation of the quality of methodologies could be a potential limitation of systematic literature reviews.

This study makes use of the systematic literature review process, whilst taking note of guidelines, in order to gain from its many advantages. Kitchenhams & Charters (2007) guide to Systemic Literature Reviews (SLRs) in software engineering, and Petticrew and Roberts (2006) refer to the advantages of SLRs within social sciences. Rousseau, Manning and Denyer (2008) refer to the use of SLRs within management and organisational science, and Levy and Ellis (2006) provide information on conducting literature reviews in information systems. Webster and Watson (2002) provide advice on writing up literature reviews within information systems by adopting the following steps:

- **Identification of the purpose of a literature review**

The objective for conducting a literature review in this study is to explore what is known about the factors that influence citizens' adoption of e-government, as well as examining cultural factors that may influence the adoption of e-government within Saudi Arabia.

- **Protocol and Training**

Following the identification of the purpose of a literature review, it is important to plan work before progressing further. A draft strategy relating to the literature review sections was produced for this study, together with estimations of the time used for each part, as well as drafting the questions for the research.

- **Literature search**

The characteristics of users and their influence towards the adoption process are considered in this study, together a clear focus upon on literature relating to developing countries. Internet resources are also utilised, including Elsevier (ScienceDirect), IEEE (Comp Soc & Xplore) and ProQuest (ABI/INFORM) in addition to an index search of *Government Information Quarterly*, *Information Systems Research*, *Journal of MIS*, *MIS Quarterly*, *The Electronic Journal of e-Government*, *Public Administration Review* and *conference proceedings of the European Conference on e-Government*.

Searching of the key phrase of the 'adoption of e-government' is examined at the beginning of the study, becoming more specific with the phrase 'citizen's adoption of e-government'. An Internet search for e-government provided 2869 relevant items from various fields, such as management, governmental and information technology.

- **Practical screen**

This study included current studies, as well as filtering theoretical based research, whilst including research from both developed and developing countries, in order to provide relevant comparisons, as well as avoiding bias. The filter feature was used in this study to reduce the number of relevant research to 221 studies with the key word 'adoption of e-government'. This provided 89 references with the key word 'citizen's adoption of e-government'.

- **Quality appraisal**

The determination of whether a paper was included or not was based upon the number of citations, together with the reputation of the published journal. In addition, a backward technique was used by following the references of high quality papers, together with the author's earlier work, as well as forwarding techniques by searching for additional work by the author after a certain date (Webster and Watson, 2002). In this study, a sorting feature in the database was used, which revealed the study by Carter and Belanger (2004), which is called 'The utilisation of e-government services: citizen trust, innovation and acceptance factors'. This study was referred to on 103 occasions, being the most cited research

reference within this category, with 103 times from the web of science database. The backward and forward technique was then used to follow the work of these researchers both before and after 2004. Further work in 2003 and 2008 by the same authors was revealed entitled 'Trust and risk in e-government adoption' which have been useful references for this study. Recent and less cited publications were also evaluated by reading the abstract, together with the conclusion, before deciding whether or not to read the full report.

- **Synthesis of studies**

A qualitative paradigm was applied to this study by collating and summarising the literature and integrating the findings. The process of collation was carried out by creating a general folder for each chapter, together with a number of sub-folders that contained the most relevant materials for the research. The summarisation process used the technique of highlighting and then by consistently integrating the highlighted sections. Quantitative synthesis involved producing a table that contained the main issues within the literature relating to the theoretical study of citizen's adoption of e-government, which related to both the base theory and the influence factors for each study. An emphasis on the table summary used to synthesis the literature review provides an overview of the key characteristics of the reviewed studies (Millar, 2004; 143).

The use of a systematic literature review was a useful step in this study, which helps to summarise existing evidence relating to the factors that encourage or restrict the adoption of e-government from perspective of citizens. This process assisted the researcher in identifying omissions in previous research, as well as enabling the generation of the hypotheses and questions for further research. In addition, the use of the systematic literature review process provides an appropriate background and suitable framework for new research. In terms of quantitative research, this process enhances the possibility of finding effects that smaller studies were unable to locate.

## **Theory and research**

Empirical research within the study and how both research and theory are linked together in a systematic way are discussed in this section. Research is considered as the creation of new knowledge and/or the use of existing knowledge in a new and creative way so as to generate new concepts, methodologies and understandings. This could include synthesis and analysis of previous research to the extent that it leads to new and creative outcomes.

Relationships between the research and the theory of research could be challenging with research findings and theory providing contradictions. This study is based upon socio-technical theory (Trist & Bamforth, 1951; Emery and Trist, 1960), which asserts that both technical and human systems within an organisation merge to achieve successful technological implementation. Factors affecting the adoption of e-government involving social, psychological and cultural aspects are considered in this research. Merton (1967, p39) considers that "grand theories offer a few indications to researchers as to how they might guide or influence the collection of empirical evidence". Grand theory operates at a general and abstract level, which contradict middle age theories with a higher level of abstraction. Various theories are used in this study, which include social, psychological and technical fields, such as TAM, DOI, and UTAUT. This helps to identify the factors that influence the adoption of e-government by citizens, together with a moderated cultural value.

This study is considered to be deductive research, commencing with a theory and deduction hypotheses, subject to empirical scrutiny and followed by an analysis of the results to reject or confirm the hypotheses, resulting in a revision of the original theory. Deductive research is described by Collis and Hussey (2009), as a study in where conceptual and theoretical structures are developed, which are then tested by empirical observation. The deductive research approach may also be described as a top-down approach, commencing from the general to more specific terms, and follows logically from the original premise.

In contrast, the theory within inductive research is developed from empirical research. General inferences are gathered from specific instances. Inductive approach moves from specific observation to broader generalisation as a bottom-up research approach.

## **The Purpose of the Research**

The research is classified according to the reason why it is conducted into various categories: exploratory, descriptive, analytical and predictive (Collis and Hussey, 2009). Other literature often categorises the research, according to its purpose, and into three main classifications: exploratory, descriptive and explanatory (Robson, 1993).

- Exploratory research is conducted in order to identify initial patterns, hypotheses or ideas in a new field of study. It seeks to clarify the nature of the problem rather than testing or confirming theory. According to Robson (1993), exploratory research is usually used to ascertain what is happening; to discover new insights; raising questions, as well as assessing phenomena in a fresh manner. The usual methods employed in exploratory research are observation, case studies and historical analysis. Such techniques tend to be general, requiring considerable gathering of data, yet provide more information for future research. Exploratory research rarely provides a conclusive answer to the problem or issues raised.

- Descriptive research describes an existing phenomena or problem that requires some familiarity with the proposed area of study. It examines information of a certain phenomena and characteristics more thoroughly than an exploratory research. According to Robson (1993), descriptive research aims to create an accurate profile of people, situations and events.

- Analytical research, or explanatory research, according to Collis and Hussey (2009), is a continuation of descriptive research, but is more flexible in allowing the researcher to explain and analyse and explain the reasons behind the occurrence or phenomena. Explanatory research extends a description of the problem by explaining the reasons behind it. Addressing and controlling certain variables in order to identify the phenomena and to investigate the problems that cause this phenomenon is one of the critical characteristics of explanatory research.

- The prediction of a certain phenomenon on the basis of hypothesised general relationship further extends explanatory research (Collis and Hussey, 2009). Explanatory research explains the phenomena in a certain situation whilst predictive research generalises results where both contain similar characteristics or criteria to similar situations elsewhere. Predictive research predicts how, why and where the answer to both current, as well as similar future events.



Based upon the research questions of this thesis, a descriptive study was adopted in order to describe the research into the phenomena of the adoption of e-government in Saudi Arabia from the perspective of citizens. The study then extends beyond this aim to explain its adoption, and the social, psychological and cultural factors that affect this. Effective explanatory research is based upon sound descriptive knowledge, and an explanation of the behaviour and the attitudes of the users could not be achieved without considering and describing the general aspects of the phenomenon of e-government. Researchers use the descriptive paradigm in order to identify the main variables, and conclude with the explanatory approach to test the variables for the relationship between cause and effect (McNabb, 2010). In order to examine the theory based model to achieve the main objective of this study, and to answer the research questions, this thesis will use the descriptive approach for the initial research. In order to consider the correlation between the independent variables and the dependent variable (adoption of e-government), the explanatory approach will be used.

## **Research philosophy**

A research philosophy is based upon the belief of the researcher concerning the manner in which research or data about a certain phenomenon could be conducted, analysed and reported. According to Creswell (1994), this model of philosophy allows researchers to suggest claims about the knowledge that is required for a study (ontology), how it may be achieved (epistemology), and the value contained in that knowledge (axiology), how the knowledge is written (rhetoric), together with the process for studying that knowledge (methodology).

## **Epistemological Considerations**

The epistemology is based upon assumption of knowledge based upon a body of knowledge contained within a certain discipline. It relates to studying the social world using similar procedures, ethos and principles of natural sciences. Positivism and interpretivism are the two main approaches to epistemological philosophy.

## **Positivism**

Positivism is a model that is rooted in natural sciences and based upon the idea that reality is independent of investigation, yet the main objective is to reject or confirm theories based on empirical research. Those who believe in positivism consider that research is a logical and scientific method to provide precise findings by using a deductive approach by which social phenomena may be explained. "Positivism has a long and rich historical tradition. It is so embedded in our society that knowledge claims not grounded in positivist thought are simply dismissed as unscientific and therefore invalid" (Hirschheim, 1985, p.33). The world, viewed through the eyes of positivists is managed by the rules of cause and effect, which are constant, to statistically and systematically explain the relationship between variables. Reality is fixed and may be explained and observed from an objective stance without disturbing the phenomena being studied, therefore it reveals existing reality.

In contrast, post-positivists consider that isolation and total objectivity from the world is not possible, and considers that the model of natural science was not applicable to all social research. According to Phillips and Burbules (2000), post-positivists believe in the possibility of an objective reality and challenge the traditional notion of the absolute truth of knowledge. Post-positivists consider that reality fails to be uncovered by our research, but that researchers should discover reality in the best ways possible. The development of numeric measures, together with observation of individual behaviour is essential for post-positivists (Creswell, 2009). However, followers of the post-positivist approach claim that it is not possible for researchers to be certain about their research, but they should be confident about their findings and rely on future prediction.

The suitability of positivism paradigm in social science research has been greatly discussed and argued about in the literature (Hirschheim, 1985). Some positivists claim that individual behaviour, personal belief and attitudes could be explained and studied in terms of the methodology of cause and effect (May, 1997). In order to discover the dependent and independent variables, as well as finding the salient factors of measurable scale questions and statistical analysis, the social or psychological model may be applied. The main aim of the positivism model is to relate findings to the larger population. However, complete reliance upon theory and instrument tools restricts the link between everyday life and the research and fails to take into account in depth the phenomenon being studied.

## **Interpretivism**

Interpretivism is contradictory to positivism and considers that social research is different to scientific natural or scientific (Bryman, 2008). The interpretivism paradigm attempts to differentiate between human and objects and interpret the subjective understanding of social action to achieve explanations based upon cause. The key difference between positivism and interpretivism is the study of certain phenomenon, which claims that researchers cannot avoid affecting this phenomenon but they are interacting with it. In essence, it is impossible to isolate the researcher's mind from what they are doing (Creswell, 2009). According to interpretivism, social reality is subjective and part of scientific knowledge.

## **Ontological Considerations**

Ontological philosophy considers the nature of the reality, and its main assumptions are:

- That social reality is an external objective entity with one reality, and as claimed by positivists, and
- Whether social reality is subjective and thought of as constructions based upon the perceptions, or the perceptions of social actors with multiple realities, as claimed by interpretivists (Collis and Hussey, 2009).

## **Objectivism**

Social actors are isolated and independent of the social phenomena being studied, according to objectivism. "cultures can be viewed as repositories of widely shared value and customs into which people socialised so that they can function as good citizens or as full participants" (Bryman, 2008, p.18). Accordingly, people may be constrained by culture, because the culture's beliefs and values are internalised. The study of the adoption of e-government from citizens' perspective, as described in this study, social and cultural factors are considered as external entities from the citizens and have a reality of their own.

## **Constructionism**

According to Bryman (2008), in contrast to objectivism, constructionism concerns an ontological paradigm, whereby social phenomena and its meaning are accomplished by social actors and researchers are thought of as another version of social reality. Becker (1982: p.521) commented that culture is continuously created and shaped by people, according to their own perspectives.

## **Axiological considerations**

The axiological assumption relates to the role of value:

- Positivists consider that researchers have no effect on the object or phenomena being observed; therefore the research is unbiased and value free.
- Interpretivists, by contrast, believe that they are part of the phenomena being studied. They are unable to detach or be independent of the research that is being conducted. As a result, the research is considered as value-laden and biased towards the behaviour and beliefs of the researcher (Creswell, 1998; Collis and Hussey, 2009).

## **Rhetorical considerations**

The rhetorical assumption is concerned with research language.

- A formal style of writing is often used by positivists, which is based on a set of impersonal voice, definitions and the writing style makes use of accepted quantitative words, whilst emphasising the passive voice, because their research is regarded as independent with no interference (Creswell, 1998).
- Interpretivists claim that the researcher is part of the study and the present and future tenses are usually used within their research. An informal style, whereby evolving personal voice, evolving decisions and accepted qualitative words are used in their research (Creswell, 1998).

## **Methodological considerations**

The methodological assumption relates to the process of the research.

- Within the positivism approach, researchers make use of the deductive process, the analysis of cause and effect, prepare a static design of categories that are isolated before the study, looking for generalisations that follows through to explanation, prediction, understanding, together with an emphasis upon reliable and valid reporting (Creswell, 1998).
- Interpretivists make use of an inductive process, employ emerging design-categories which identified during the research process, mutual simultaneous shaping of factors, follow context-bound patterns, develop theories for understanding, whilst emphasising on reliability and accuracy and through a verification process (Creswell, 1998).

On the other hand, Interpretivists could use the quantitative method as well as the qualitative method could be applied by positivism approach holders based on upon the underlying philosophical assumptions of the researcher.

The following table is a summary of the main characteristics of both the positivism and interpretivism philosophy from various perspectives:

Philosophy assumption	Characteristics	References
Positivist	<ul style="list-style-type: none"> <li>Assumes that reality is objective given and can be described by properties that are measureable.</li> <li>Studied phenomena are independent of the researcher and his/her instruments.</li> <li>Supported by numerical data.</li> <li>Hypothesis testing used.</li> <li>Attempts to test theory.</li> <li>Data is precise and specific.</li> <li>Independent facts form the basis of knowledge.</li> </ul>	Denzin and Lincoln (1998); Gaillers (1992) ; Hussey and Hussey (1997); Lee and Baskerville (2003) Myers (1997) ; Orlikowski and Baroudi (1991); Remenyi (1998); Walsham (1995); Yin (2003); Bryman (2008)
Interpretivist	<ul style="list-style-type: none"> <li>Assume that the reality is socially constructed.</li> <li>Describe, translate and understand phenomena through meanings that people give to them.</li> <li>Attempt to understand the context of the phenomenon and how context influences it.</li> <li>Deeper structure of phenomenon within the cultural and contextual situation is understood.</li> <li>Collects data that is relevant and subjective.</li> <li>Qualitative data tests.</li> <li>Theory generation is regarded as important.</li> </ul>	Denzin and Lincoln (1998); Gaillers (1992;) Hussey and Hussey (1997); Lee and Baskerville (2003); Myers (1997); Remenyi et al. (1998) ; Yin (2003)

Table 5.1: Philosophy Assumptions.

Quantitative and Qualitative Paradigm are more likely to maintain different assumptions as summarised in the Table below: (Creswell, 1994)

Assumptions	Questions	Qualitative	Quantitative
Ontological	Reality: What is its nature?	Participants in a study see reality as subjective and multiple.	Reality: Singular and objective, with the exception of the researcher.
Epistemological	What is the relationship between the researcher and that being researched?	Interaction of the researcher with that being researched.	Researcher independent from that being researched.
Axiological	What is the role of values?	Biased and value-laden	Unbiased and value-free
Rhetorical	What is the research language?	Informal style Decisions evolving Personal voice Qualitative words	Formal Set definitions used Impersonal voice Accepted quantitative words used
Methodological	What is the research process	Inductive process Simultaneous mutual shaping of factors Design-categories identified and emerging during the research process Context-bound Theories and patterns developed for understanding, Verification that is accurate and reliable	Deductive process Cause and effect Static design-categories isolated before study Predictions arising from generalisations, understanding and explanations Valid, reliable and accurate

**Table 5.2: Methodology Assumptions.**

Assumption based upon positivism form the philosophy of this thesis, and is based upon a number of reasons. Firstly, the philosophy of the research should be consistent with the main research objective and research questions. Research for this study is based upon the cause and effect approach in order to test certain theories aimed at discovering the salient factors that affect the adoption of e-government by citizens. Objective reality, based upon the systemic method by measuring the relationship between variables, is the aim of positivism. Secondly, this thesis is based upon developing hypotheses and the testing of theory as a deductive approach concerned with positivism assumptions. Thirdly, the investigation of the problem of the low adoption rate of e-government suggests that the reason relates to the different perspectives of citizens that do not require interference perspectives based upon theories and models from an ontological objectivism viewpoint. Positivists attempt to detach themselves from the dependent and independent variables in order to explain the phenomenon being studies. Fourthly, this research seeks to generalise findings from the sample of the population, by using positivism assumption. Fifthly, the research needs to rigorous in obtaining precise data with high reliability and validity to measure attitudes towards the adoption of technology adoption by using a systemic model. These assumptions are compatible with the positivism approach that requires objective statistic data, together with a large statistical sample.

## **Methodology of the Research**

A deductive or inductive research method, together with the philosophical approach to the research, determines whether quantitative or qualitative method should be used in the study (Creswell, 1994).

The deductive approach is used in this study and follows positivist assumptions that are mainly associated with the quantitative methodology, whilst the deductive approach and interpretivism assumptions are usually associated with methodology that is qualitative methodology. This section examines the difference between the two methodologies, together with the identification of the strengths and weakness of the quantitative method before a final decision is made.

Bryman (2008: p. 22) states that the quantitative method can be constructed as "a research strategy that emphasises quantification in the collection and analysis of data".

Accordingly, the quantitative methodology uses a deductive approach that involves the testing of a theory. In addition, quantitative research often links with the philosophy of positivism, incorporating the norms, principles and practice of natural science. A view of social reality as an external, objective reality is part of quantitative research.

The qualitative method, in contrast, is structured as "a research strategy that usually emphasises words rather than quantification in the collection and analysis of data" (Bryman, 2008: p. 22). An inductive approach and the generation of theory relating to the relationship between theory and research is the focus of qualitative methodology. Qualitative research maintains an emphasis on interpreting the social world. An emphasis upon the role of the individual role and the creation of social reality are embodied within qualitative research and its view of constructionism.

The quantitative method is defined by Creswell (1994:p.12) as "a type of research that explains phenomena by collecting numerical data that are analysed by using mathematically based methods (in particular statistics)."

The two methods are differentiated by Creswell (2009) as follows: a pre-determined design is utilised by the quantitative method, whereas qualitative research emerges by generation a theory throughout the research. The researcher is also regarded as the key instrument within the qualitative method for data collection in the use of open-ended questions. The quantitative method utilises an instrument that is based with closed questions. Performance, attitudes, census and observational sources of data are used in the quantitative method, whilst the qualitative method used interviews, observations, documentation and audio-visual data sources. Statistical analysis is used within the quantitative method, whereas the qualitative approach uses images, words and textual analysis methods. The quantitative approach uses methods of statistical interpretation, whereas the qualitative approach interprets patterns and themes (Bryman, 2008).

Other features of quantitative research include measuring and viewing social reality, and seeing the world as a reality that is determined objectively, together with a focus upon measuring accurate data with objective numbers (Frankfort-Nachmias & Nachmias, 1992). This view of quantitative research is compatible with the findings of Kealey & Protheroe (1996), who support the quantitative method of eliminating or minimising the judgement subjectivity.



Quantitative research is also useful when attempting to quantify personal belief, behaviour and opinion in order to discover the attitudes and perceptions of populations towards certain phenomenon. Presenting the outcome of such quantitative research in the form of charts, graphics and tables is a great advantage, as is the explanation of some phenomena by the correlation between independent and dependent variables by using scales of measurement and appropriate tools. Quantitative methodology is considered as ideal for the testing of theories and hypotheses. In addition, quantitative methodology is thought to be a replicable method generalising the findings of a population sample, as well as being a bonded and structured method that allows for savings in the researcher’s effort, cost and time (Bryman, 2008).

Some drawbacks of quantitative research methodology include its limitation in describing and understanding certain phenomena, inability to observe gesture, and lack of control of the environment for data collection process. It fails to provide situational context, and gives only limited and specific information due to the nature of closed and structured questions. Quantitative research is criticised by some researchers because it fails to distinguish people and social institutions from the world of nature. Despite the measurement process being conducted precisely, there is some artificiality, as well as an insecure sense of accuracy. Complete reliance upon theory and instrument tools restricts the link between everyday life and the research and fails to take into account the phenomenon being studied. The analytical process of the relationship between variables creates a static view of social life that may not reflect actual life (Bryman, 2008).

**Table 5.3: A summary of the strengths and weaknesses of quantitative research.**

Strength	Limitations
The replication of findings to a large population.	People do not respond in the same way as inert matter within the physical sciences.
Replication to many different populations and subpopulations.	Mechanistic ethos that may ignore ideas of choice, moral responsibility and freedom of freedom.
Quantitative predictions may be made.	Possibility of abstract and general information being produced.
Quantitative, precise numerical data is provided.	Reduced opportunity to express feelings and experiences.
Causal statements may be produced by controlled experiments.	Theory testing and hypotheses is focussed upon more than the phenomenon.
Statistical techniques allow for rapid and detailed sophisticated analyses of data.	Variables are difficult to control.

(Adapted from Burns, 2000: 9-10; Johnson, & Christensen C 14 nt).

The investigation of the problem of low adoption of e-government programme from the citizen's perspective by determining the psychological, technical and social factors, moderated by socio-cultural value, is the aim of this research. This study considers the adoption of various theories and models in order to measure the variables and verify the hypotheses that are features of quantitative research methodology. In addition, this research aims to replicate the research outcomes to the wider population.

E-government is a new initiative for the country and as such is at an early stage of development. It lacks the depth and detail of independent research, because of the lack of information and citizen's experience of using the system.

The society of Saudi is conservative by nature, which emphasis segregation by gender. This will influence the strategy of this research by avoiding direct contact in the method of data collection; otherwise the research will be biased towards one gender only. The quantitative method is selected for this research as being the appropriate methodology.

This section has attempted to justify the appropriate methodology for the research by using the quantitative method, whilst considering its limitations, as well as its main features and strengths. Research strategies and the selection of suitable instruments will be discussed in the next section, together with the consideration and testing of positivism philosophy and the deductive approach as research philosophies.

## **Research Strategy**

The selection of the research method is an important part of the research process. This is followed by the selection of a plan and procedures for conducting the study and answering the research questions. Researchers use a variety of terms to discuss the various strategies of enquiry, including approaches, methodologies and research design. The various strategies of enquiry are associated with different research philosophies and methodologies.

Interpretivism philosophy and qualitative methods are associated with grounded theory, case studies, ethnography, narrative research and phenomenological research as methods of enquiry (Creswell, 2009). Yin (1993) asserted that method alone does not select the form of data collection to be used, which can be either qualitative or quantitative.

Ethnography is "a strategy of inquiry in which the researcher studies an intact cultural group in a natural setting over a period of time by collecting, primarily, observational and interview data" (Creswell, 2009:p.13). Grounded theory is defined as "a systematic set of procedures that are used to develop an inductively derived theory about phenomena" (Collis and Hussey, 2009:p. 84). Case study is "a strategy used to explore a single phenomenon in a natural setting using a variety of methods to obtain in-depth knowledge" (Collis and Hussey, 2009:p. 82). The phenomenological strategy refers to identifying human experience about a certain phenomenon, whilst the story of individual lives forms the basis of the narrative strategy. Other researchers include additional strategies to the qualitative approach, including action research, which is used as a strategy in a partly controlled environment to bring about conscious change (Collis and Hussey, 2009).

Research strategies that use the quantitative method also use the perspective of positivists (Creswell, 2009) and include research strategies, such as survey and experimental studies. Experimental study is used to "investigate the relationship between variables where the independent variables are deliberately manipulated to observe the effect on the dependent variables" (Collis and Hussey, 2009:p.74). Experimental studies include experimentation with the random assignment of subject to treatment condition, generating confidence in the trustworthiness and reliability of casual findings. Quasi-experiments are considered as a less rigorous process than by using designs that are non-randomised, and involve single-subject design (Creswell, 2009). Unlike true experiments, quasi-experiments fail to fulfil internal validity requirements. There is strong differentiation between laboratory experiments, which take place in a laboratory or a contrived setting, and the field experiment that are based upon a real life situation. Experimental strategies are excluded from the research design for this study, because of concerns about manipulation and behaviour control, attitudes and beliefs and other variables of the users of e-government.

An additional popular survey strategy, sometimes referred to as non-experimental strategy (Creswell, 2009), correlates with the quantitative methodology and the positivist assumptions, also refers to cross-sectional design (Bryman, 2008). The survey is a numerically collected set of data concerning attitudes, opinions and trends of the sample in order to generalise the findings to the population. Two main categories concerning the purpose of the survey, together with descriptive and analytical content are included.

An accurate representation of a phenomenon at various times is included in the descriptive survey, whilst the purpose of the analytical survey is to consider relationships between two

or more variables (Collis and Hussey, 2009). Cross-sectional and longitudinal studies by using questionnaires or the structured interview technique are included in the survey for data collection purposes (Creswell, 2009).

Cross-sectional surveys are used to investigate various variables over the same period of time, but in a different context. It provides a snapshot of a certain phenomenon in a short time, and is a cost effective strategy, where the findings could be replicated to the larger population (Bryman, 2008). Challenges face the cross-sectional survey in sample selection that represents the entire population, as well as considering how to isolate the phenomena under study from all factors that may affect the correlation. There are issues with the development of a structured survey that is able to measure certain phenomenon or individual behaviour. Evaluating criteria for the cross-sectional survey was examined by Bryman (2008), who found that the possibility of replication and external validity is strong, whilst internal validity is often weak in cross-sectional surveys.

The dynamism of a research problem by investigating the same variables or group of subjects continuously or over a long period of time is the purpose of the longitudinal survey. It is good for observing and evaluating change within a changeable environment, as well as providing good opportunities for the variables in the study to be controlled by researchers. Despite this, the longitudinal survey has a number of limitations, including the possibility of losing some of the variables or members of the study group over the time. In addition, it is a time consuming method, as well as expensive to conduct. A smaller sample size is used by the longitudinal survey that affects the generalisation of the population findings. However, it is claimed by some researchers that these weaknesses contained within longitudinal surveys may be overcome by the use of secondary data (Collis and Hussey, 2009).

This positivist quantitative study deployed the cross-sectional survey as an appropriate strategy for this research for a number of reasons. The investigation of the cause and effect of the dependent variable which is low adoption of e-government from the citizens perspective, and its association with the multi independent variables that may influence the adoption and include social, technical, psychological and cultural factors, is the aim of this investigation. Therefore, it is necessary for this study to discover the relationships between multi variables at the same time. Such independent variables comprise of beliefs and attitudes and personal behaviour that cannot be manipulated or controlled.

In addition, the replication of its findings to larger populations and the wide geographic region are important factors to consider. The length of time for the various stages to be implemented reflects its influence on the citizen's adoption, which needs a longer period, and therefore excludes application of the longitudinal survey in a short period of time.

## **Research Sample**

Sampling is a process of selecting a subset of people who represent the entire population to survey. However, cost constraints, time, sample size and research objectives will affect the sampling method selected. Sometime the survey could be conducted as a form of census by survey every unit within the population, but this case is commonly impossible with large sample or wide geographical area.

### **Types of sampling**

Convenience sample, which also called non-probability and random which refers to probabilistic sampling, form the two categories that subdivide sampling methods. To enable the possibility for any person to be selected from the population, participants are selected randomly in a probability sample. In contrast, when the researcher selects the sample population or when related to the convenience of the participant, then this would be a non-probability sample (Bryman, 2008).

Cluster sampling, stratified sampling, systematic sampling and simple random sampling are often used for probability samples. To ensure groups included in the sample are of equal size, the simple random sample is used, but when there is a sub-division of the population into different homogeneous groups that are drawn into the sample from each group, stratified sampling is used. When various clusters of individual units need to be categorised, then cluster sampling is used. Cluster and stratified sampling differ in that only selected clusters are surveyed randomly with cluster sampling, but there is a random survey of each strata with stratified sampling. By avoiding a table of random numbers, units are selected directly and randomly from the sample with systematic sampling. Although, Probability sampling offers various advantages, such as making inferences from the random sample to the whole population and generalising the findings from the sample to the whole population, it costly, covers smaller sample with limited variations (Bryman, 2008). This study sought large sample with different characteristics such as various age, gender, internet experience and level of education.

Snowball sampling, quota sampling and convenience sampling are often used for non-probability samples. Accessibility of the sample and the judgement of the researcher form the basis of convenience sampling. To identify different categories or groups with relative proportions of participants, quota sampling is used. In contrast, when original participants refer the survey to other respondents, this creates snowball sampling. Although there are limitations when generalising to the whole population, as well as making inferences, the advantages of non-probability sampling is that it is cheap, targeted, convenient and fast for a large sample (Bryman, 2008).

### **Errors in sampling**

To ensure the quality of the survey sample is enhanced, the design stage requires the researcher to consider errors that could be encountered in the sampling process, and four categories of sampling errors were proposed by Groves (1989).

Coverage errors can occur when there is a mismatch between the frame population and the population of inference, so that units of the population are excluded, and Groves (1989) suggests the following three types:

- The intention of the research to make inference about the population forms the population of inference.
- "The population of inference less various groups that the researcher has chosen to disregard" forms the target population (Fricker, 2006:p.198).
- "The set of individual for whom some enumeration can be made prior to the selection of the sample" forms the frame population (Groves, 1989:p.82).

However, to ensure the sample is consistent with the population of inference by using the strategy of post-stratifying sampling, and adopting frameless or ideal complete sample frame techniques, coverage errors could be reduced. Errors also occur when different samples create different survey data, because not every element of the frame population is measured, but increasing the sample size could reduce sampling errors.

When some participants are unable or unwilling to complete the survey, non-response errors occur, and the contributing factors affecting the non-response rate include unknown factors, security issues, time consumption and survey design.

These errors could be resolved by motivating the participants and following up initial contacts, as well as ensuring that the survey is designed to be understandable, short and easy.

When there is deviation between true responses and actual answers from participants, inaccuracy creates potential measurement errors. However, these measurement errors are often caused by errors in the design of the survey, such as mistakes in typing or unclear wording, as well as poor motivation of the participants. Measurement errors can be overcome by motivating the participants, and testing and revising the survey before starting (Couper, 2000; Fricker, 2006).

### **Online survey sampling methods**

Online surveys have changed the traditional method of collecting data for surveys, such as post or telephone, since the rapid spread and penetration of Internet accessibility. Online data collection also offers advantages of cost saving and quicker response, but also presents a significant limitation, as the generalisation of findings from online surveys to online users lacks viability. Online surveys also present a challenge to researchers in selecting the appropriate sampling strategy, as this is often determined by the modes of contact by respondents. Sampling methods for probability and non-probability methods were suggested by Cooper (2000) for online surveys and described below.

#### **Probability sampling methods for online surveys**

When inference to the whole population and population counting are needed, results generated from probability sampling are more valid, such as good measurement and frame sampling; however, when compared to non-probability methods of sampling it presents weaknesses, such as small sample size, time consuming, expensive and low rates of response. Methods of probability sampling include pre-recruited panel surveys, mixed-mode surveys with Internet-based options, pop-up or intercept surveys, non-list-based random sampling and list-based sampling frames.

##### ***List-based sampling frame for surveys***

When there is an easily accessible e-mail list, such as government departments, university staff or company employees that are described as a closed population list, this method of sampling is used. By adopting a simple random sampling technique from the list of e-mails, this is a straightforward method of sampling, but also presents weaknesses, such as

participants in some cities or rural areas that have no list of e-mails or modes of online contact, so could not be applied to a general or open population.

### ***Non-list-based random sampling for surveys***

A sampling frame does not need to be enumerated for this method, as its traditional use has been for telephone surveys that adopt random digital dialling (RDD). However, this technique cannot be adopted for online surveys, but RDD is still used to identify possible participants and invite them to contribute to the online survey.

### **Pop-up or intercept surveys**

Systematic sampling of pre-determined visitor numbers to a web page or website is adopted by pop-up or intercept surveys on the Internet. An advantage of this method is that results could be generalised to specific populations, as the sampling is systematic, but its limitations include lack of information about participants to judge any bias for non-response (Couper, 2000).

### **Surveys using pre-recruited panels**

For this method, participants are found by simple random sampling method, who then agree to undertake the online survey, but this is time consuming and expensive (Fricker, 2006).

### **Non-probability sampling for online methods**

According to Schillewaert et al. (1998), non-probability sampling offer advantages, such as cost effectiveness, speed and large scale for surveys as an alternative to probability sampling, so that the researcher can make exploratory interpretations and inferences about the attitudes and behaviours of online users towards the Internet. However, a limitation of this sampling method is lack of knowledge of non-zero probabilities for selection, so that generalisations or inference to the whole population are often based on insecure evidence when compared to statistical principles (Couper, 2000). Non-probability sampling adopted for online methods often include opt-in or volunteer panels for surveys, 'harvested' e-mail lists, unrestricted self-selected surveys and entertainment polls.

### **Entertainment polls survey**

This survey attempts to obtain opinions regarding general issues that lack restrictions for any sample frame, so that entertainment polls surveys are defined as unscientific.



### **Unrestricted self-selected surveys**

No restrictions are adopted for this survey, as any Internet user could participate in a survey that is posted on multiple or one specific website, and various advertising media, e-mails and other websites are used by researchers to advertise and promote their survey. Limitations of this survey type allows participant to contribute or not to contribute to the survey, and lacks a sample frame. However, respected scientific institutions support this survey type as a legitimate approach (Couper, 2000).

### **Harvested' e-mail lists adopted for surveys**

"Harvested e-mail lists are sets of e-mail addresses collected from postings on the web and from individuals who are (wittingly or unwittingly) solicited for their e-mail addresses" (Fricker, 2006:p.23). Researchers using this type of survey purchase unsolicited e-mail lists, which is a commercial, rather than a professional, approach for carrying out a survey, and might even be illegal or violate ethical and professional standards.

### **Opt-in or volunteer (opt-in) panels used in surveys**

Participation for this type of survey is based on participants who opt or volunteer for the survey, which differs from the probability pre-recruited panel as these participants are randomly selected with a different selection mechanism. Self-selected survey is also different from this type of survey, as the volunteer panel provides information about themselves and the number of other surveys to which they have contributed.

### **Determining the sample for this thesis**

The sample for this research needs to be determined that could represent the whole population of Saudi Arabia that is shown to have people from different ethnic backgrounds and with a wide geographical area. This sampling process will need to specify the sample size, determine the technique for sampling, shape the sampling frame and define the population (Luck & Rubin 1987; Malhotra 1999; Wong 1999).

### **Sample: Defining the population**

Adult Saudi citizens will form a target sample population for this survey that should represent various levels of education, different locations, gender and age groups. As all Internet users would be able to participate and without restrictions, the unrestricted self-selected survey can be posted on multiple websites. This research was initially targeting

adult Saudi citizens as its population, but this was changed to online users that were Saudi citizens due to difficulty of sampling and the large population. By the end of 2012, Internet penetration in Saudi Arabia reached 16 million users (55%) which affirmed relatively high penetration among half of the population (CITC, 2012).

### **Sample: Shaping the sampling frame**

Participants were asked to complete an online questionnaire, and participation was voluntary. This research targeted blogs of various interests and national forums related to different interests to attract asynchronous social public website visitors. For this study of diversity to include a wide geographical area and various population characteristics, unrestricted sampling method should ensure an aggregation of heterogeneous national forums. The questionnaire included a covering letter of explanation that was sent by e-mail to friends, family and potential participants with an invitation to contribute to these research findings. As well as inviting people to participate in this survey, the researcher posted links to the online questionnaire on various social networking websites.

### **Sample: Determining the sampling technique**

This research used the non-probability sampling method, and unrestricted self-selected survey technique was determined for this study. As this approach attempted to cover a wide geographical area and survey a large population to gain information from a diverse range of respondents' characteristics and heterogeneous groups, this method was determined to be the most appropriate. As different public social groups and discussion forums were used to post links to the survey online questionnaire, this technique was determined to be the most appropriate. To encourage participants, the survey was promoted through the use of various public social media networks, such as Facebook and national forums, related to different cities across the country of Saudi Arabia.

The literature review on this subject suggests that, in general terms, the sample size needs to be at least 300, although 1000 would be excellent and 500 would be very good (Comrey and Lee, 1992; Tabachnick and Fidell, 2001). As a result of these findings, the researcher targeted a range of 500 to 1000 participants for this study.

## **Collecting data**

Characteristics of the data, objectives and the research problem will influence the tools or instruments that should be selected for data collection. The obstacles of low adoption of e-government services have been the focus for this study relating to Saudi citizens, and the aim of this research is to identify what factors could influence this adoption by examining cause and effect relationships influenced by statistical data. Writing or computer-based questionnaire designed to evaluate respondents' behaviour, attitudes and beliefs towards a certain phenomenon was the research strategy for this study (Malhotra, 1999).

## **Survey methods**

The most significant data collection tools used in the social survey process is the self-completion questionnaire and the structured interview. Interviewees included in the structured interview part of the survey are asked the same standard questions, which may be conducted using face-to-face, by telephone or video conferencing modes. The methodology of the survey instrument has a high response rate, a capability to determine the sample frame, as well as assuring the identity of the participants. The main concerns relating to the structured interview are its high cost, required interviewing skills, as well as being time consuming, which makes it unsuitable for use with a large population or wide area (Bryman, 2008). Structured interviews were excluded from this research due to gender bias with the segregation situation in Saudi Arabia due to the cultural constraints and values, as well as the large population to be targeted.

The self-completion questionnaire is the second survey instrument to be considered, which is used to collect primary data by asking the respondents to answer and complete questionnaires. As the questionnaires can be distributed by using postal or online modes, it is cheaper, quicker to administer, and more flexible for respondents to participate at a time and place of their own convenience, and can reach larger populations and wider geographical areas. An additional further advantage of the self-completion questionnaire is the ability to measure the relationship between variables and adapt to statistical analysis. Disadvantages of the self-completion questionnaire are the lack of probing and prompting by the researcher, a lack of in-depth detail, non-response bias, as well as issues relating to the determination of the representative sampling frame (Bryman, 2008). The postal questionnaire was excluded from this research because of limitations of mailboxes, and the lack of a postal code service in Saudi Arabia.

Online questionnaires are used in this study, as this data instrument is the most appropriate research instrument for data collection. Online questionnaires use the Internet or email lists to distribute the questionnaire to the respondents who have been selected. However, this method of distribution is restricted to online users and therefore cannot produce representative random data samples that are applicable to the entire population. Couper (2000) comments that that electronic surveys target large populations who are not part of organisations at the centre of society's power. In addition, the online questionnaire has many advantages, including coverage over a large population and unrestricted access to a wider geographical area. Electronic surveys are economic to conduct, usually look attractive, have a flexible layout, allow for a prompt response, provide anonymity and are more convenient for the respondent, as well as taking less time to conduct and analyse data (Bryman, 2008). Web surveys also include additional features, such as links, clicks, defaults and menus (Preece et al, 2002). Click options allow textual data entry to be eliminated, and the links option is able to references definitions or examples throughout the survey. Hidden or displayed defaults reduce the number of non-responses to the questions, and drop-down or displayed menus allow for many options to be provided. Despite these clear advantages, Dillman (2000) points out that too much graphics, as well as Web-based surveys that are poorly designed and presented, increase the download time, confuse respondents, as well as reducing the rate of response.

## **The Design of the Questionnaire**

Questionnaire design requires the correct measurement scale, appropriate wording of questions and content, the layout response and sequence of questions to be chosen. This study has adopted the procedure established by Churchill and Iacobucci (2004) in order to develop a questionnaire that contains nine steps as follows:

**Step 1:** Specify the information that is required.

**Step 2:** Decide the types of questionnaire and administration method.

**Step 3:** Decide the content of individual items.

**Step 4:** Decide the form of response.

**Step 5:** Decide upon the wording of each question.

**Step 6:** Decide the question's sequences.

**Step 7:** Decide the layout of the questionnaire.

**Step 8:** Re-examine steps 1-7 and revision, if necessary.

**Step 9:** Pre-test the questionnaire.

Specific rules for designing questions that avoid ambiguous questions were suggested by Bryman (2008). These include making the question as short as possible, avoiding double-barrelled questions, avoiding too general and questions, avoid technical questions, as well as avoiding questions that rely upon memory.

Bryman placed emphasis upon the necessity for attractive design for the questionnaire, questions that are in vertical format questions, the importance of writing a clear and concise letter, as well as providing clear instructions about how to respond, and beginning with questions that are less complex. Bryman (2008) also suggested the use of questions from previous literature, which had already been tested for validity and reliability, by adapting questions from literature relating to e-business and earlier e-government research. In order to ensure that respondents understand the questions, this study uses multi-questions in order to measure one construct. The construct here is the underlying characteristic or ability itself whereas variable is essentially what we can observe or measure of a characteristic or ability. As well as the design of an electronic questionnaire, the following criteria are deployed in this study, including the support for multiple platforms and web browsers, but multiple submissions and missing answers are automatically prevented. Open-ended or quantified-option responses are collected, which allow responses to be saved before completion. Automatic transfer of responses to the database, providing automatic feedback upon completion is also a feature of the software used (Smith, 1997; Yun & Trumbo, 2000; Andrews et al., 2003).

A covering letter is an essential part of the questionnaire that provides an important first impression to the participants, and may affect their decision of whether or not to participate. The covering letter should be clear and concise in order to persuade participants to take part in the survey. The covering letter accompanying this research questionnaire begins by introducing the researcher, identifying the purpose of the research and clearly defines the purpose and benefits of the research. The letter invites respondents to participate in the survey, as well as describing the confidentiality and anonymity policy of the survey. Voluntary participation in the survey is also explained, as well as an estimation of the time required to complete the questionnaire. Finally, the letter gives clear instructions about how to participate in the survey, and gives the researcher's contact email address for further questions or concerns.

In order to categorise the respondents in the analysing process, and to correlate these moderated variables with the main factors affect the adoption of e-government, the first part of the questionnaire sought general demographic information. This section of the questionnaire adopted closed multiple-choice question to seek personal demographic information such as gender, age, level of education and experience of use of the Internet. The literature raises questions of whether it is preferable to start with an easy classification question in order to put the respondent at ease when answering the remaining questions, or whether it is preferable to provide more interesting questions designed to encourage respondents to complete the survey. Personal factual questions, using a multiple choice closed form to stimulate the respondents, were asked in this survey, to facilitate the analysis of data by the researcher.

The second part of the questionnaire relates to the measurement of the dependent variable, which is the participants' adoption behaviour. According to Pavlou and Fygenson's marketing theory (2006), consumer awareness is the start of the adoption of a new product, which leads to attitudes towards the product and then to an intention to use the product, before regular usage and satisfaction leads to a level of acceptance. This research used a continuous approach in the assessment of the adoption of e-government adoption. This started from the evaluation of citizens' awareness of the existing system, a belief in the benefits of the system, an intention to use the system, followed by actual use and satisfaction of the introduced services. Participants opinions, beliefs and attitudes towards the questions were assessed by using a Likert scale with five scores starting from strongly disagree to strongly agree. Likert (1932) developed the principle of measuring attitudes by asking people to respond to a series of statements about a topic, in terms of the extent to which they agree with them, and so tapping into the cognitive and affective components of attitudes.

The Likert scale was utilised in this study for its simplicity in its coding and administration, as well as its ability to measure people's attitudes, behaviour and opinions (Bowling, 1997, Burns & Grove, 1997). In addition, this study used the Likert scale because it was likely to produce a high rate of response that accurately reflects the opinion of respondents. The Likert scale is a dynamic tool that spreads the variety of responses, and offers high reliability coefficients; it is a validated and reliable tool that has previously been used in social and marketing research (Aaker et al., 2000; Kassim, 2001).

The Likert scale is also used in the third part of the questionnaire to measure the factors that influence citizens' attitudes towards using e-government by considering the effect of self efficacy, trust, system quality variables and information quality. The fourth section of the questionnaire examined the variables of effort expectancy, performance expectancy, social influence and compatibility, together with their influence upon the intention behaviour to use e-government services in Saudi Arabia. Finally, the fifth part of the questionnaire examined factors relating to trust when using the Internet. Trust in the Government, the availability of resources and computer self-efficacy are all considered as factors influencing citizens' behaviour towards the e-government adoption.

Each part of the questions was shown in different forms to ensure that they were easily understood by the respondents. Most of the questions were adapted from previous literature, such as Carter, & Bélanger (2005), Kumar et al. (2007), Shareef et al. (2011) and Lin et al. (2011) and modified to ensure enhanced validity for this study. The third, fourth and the fifth parts of the questionnaire examined ten independent variables that influence the adoption of e-government among the citizens. Each factor was measured by four statements, which gave a total of forty statements.

A free space was also included in order to allow participants to freely express their individual opinion relating to other factors that may influence their adoption of e-government. This was provided in order to slightly ameliorate the limitations of the quantitative and positivist method, which provides less opportunity, when compared to open-ended questioning, for participants to express their personal experiences and feelings. This question was open ended and optional for participants to complete, whilst there was a requirement to answer all other questions in order to complete the survey.

The questionnaire was designed and distributed by using online survey software (<http://freeonlinesurveys.com/>) that allowed for enhanced design capability, as well as wider potential distribution. The online survey software provided preventing multiple responses from the same computer, a stimulating layout, prevented missing questions and ensured a secure process. It also had a skip-logic feature that allowed participants to skip some questions according to the participants' answers, as well as a filtering technique. The online survey software allowed for comparisons between the data collected, as well as the facility to download the data and display on a spreadsheet for the process of analysis.

Constructs	Items	Source
Awareness of the system	Have you heard of the e-government concept before?	Shareef et al. (2009)
	I am aware of the e-government services provided by the Saudi government.	Shareef et al. (2011) Researcher
Attitudes and behaviour towards use	Using e-government services is a good idea.	Venkatesh et al.(2003)
	I like to use the e-government website.	
Behavioural intentions to use the system	I plan to use the e-government services in the future.	Venkatesh et al.(2003)
	E-government services are something that I may do in the future.	
Actual use	Have you used e-government services before?	Researcher
Computer-self efficacy	I have the skills to use computer technology	Kumar et al. (2007), Shareef et al. (2011) Wangpipatwong et al. (2008)
	I am confident of using computer technology	
	I have the skills to use e-government websites.	
	I am confident in using e-government websites.	
Availability of resources	I can afford computer hardware	Venkatesh et al.(2003) Murru (2003), Shareef et al. (2011)
	I have adequate computer technology at home.	
	I can afford an Internet connection.	
	I always have access to a high-speed internet connection at home.	
Information quality	Information provided on the government website is up-to-date.	Lin et al. (2011) Shareef et al. (2011)
	Information provided on the government website is accurate.	
	Information provided on the government website is complete data.	
	The government website provides all relevant information necessary to fulfil my needs.	
System quality	The system suffers from shutdown problems.	Lin et al. (2011) Shareef et al. (2011)
	Online customer service is available at all times.	
	The system provides continuous access to other resources.	
	The system provides integrated services.	
	I think accessing the e-government system 24/7 is an important feature for me.	Davis et al., 1989) Al-Shafi and Weerakkody (2010),
	I think accessing the e-government system from anywhere is an important feature for me.	



Performance expectancy	I think using e-government saves me time	Wangpipatwong et al. (2008)
	I think using e-government save me money	
Effort expectancy	Learning to interact with the website would be easy for me.	Venkatesh et al.(2003); Al-Shafi and Weerakkody (2010), Wangpipatwong et al. (2008)
	I would find the website flexible to interact with.	
	It would be easy to navigate the website.	
	Interactions with the website would be clear and understandable for me.	
Compatibility	I think e-government is appropriate for my needs.	Moore and Benbasat, (1991), Carter and Bélanger (2005), Shareef et al. (2011) Researcher
	I think e-government offers the chance for women to enrol with government services online.	
	I think e-government system is compatible with my religious views and cultural attitudes	
	Using the website would fit into my lifestyle.	
Social influence	People who influence my behaviour think that I should use the e-government system.	Davis et al., (1989), Al-Shafi and Weerakkody (2010), Alawadhi. & Morris (2008).
	I would use online government services if people who are important to me also used them.	
	People around me who use the e-government system have more prestige.	
	I would use online government services if I needed to.	
Trust in the Internet	I believe that the Internet is a dependable medium.	Bélanger, and Carter.(2008), McKnight et al., (2002)
	I believe that the Internet is a safe place to perform secure transactions	
	I think that the government website has adequate security features.	
	I would hesitate to provide personal or financial information to the website.	
Trust of the Government	Government agencies are trustworthy in my opinion.	Bélanger, and Carter (2008), Shareef et al. (2011)
	I believe in the capability of the agencies to perform online transactions faithfully.	
	I believe in the ability of staff to implement online services in a private manner	
	I think government agencies have the resources to perform dependable and reliable online services.	

**Table 5.4: Survey's constructs and items.**

## **Translation**

The process of designing and preparing the questionnaire was followed by translating it into the Arabic language, the native language of Saudi citizens who were the intended respondents of the survey, to ensure better understanding and a higher response rate. Respondents were selected randomly from the general population and with varying levels of qualifications and differing backgrounds.

Back translation, which is the translation of a translated text back into the language of the original text, was the approach deployed in this study, as it the most commonly applied method used in international research (Brislin, 1970). However, this process suffers from a number of limitations, including a different use of language between bi- and mono-lingual speakers, as well as its ability to extend the sense of the overall statement, rather than a more limited literal translation (Douglas and Craig, 2007).

The translation process applied to this research was to ensure quality and efficiency of the process. Initially, the translation was completed by the researcher, which was then reviewed by two Saudi linguistics PhD students studying in the UK. The next step integrated the comments from both linguistics students into one version. Two Arabic language specialists in Saudi Arabia then reviewed the Arabic version. Finally, the comments from both Arabic language specialists were integrated into the final version, which was then available for the pre-testing and piloting stage.

## **Pilot study**

It is often recommended that researchers conduct a pilot study before starting the actual survey, and especially when a questionnaire is to be distributed to a large population, with little opportunity to manipulate the survey, which is possible in an interview process. The piloting process is designed to further refine the questionnaire, and to avoid errors that may affect the respondent's participation or the process of analysis (Saunders et al., 2007). There are sometimes common mistakes that occur that may be detected during the piloting stage, such as spellings errors, inconsistent wording, overlapping questions, inappropriate requests for demographic information, missing or incorrect instructions, the length of the survey, as well as a lack of motivational techniques (Andrews et al., 2003).

This survey has used a piloting technique developed by Dillman (2000), who suggested four steps for piloting the survey questionnaire. The questionnaire was reviewed initially by knowledgeable colleagues, who helped to ensure that it offered efficiency, relevancy, format appropriateness and completeness. Secondly, cognitive pretesting, which consisted of observation and 'think aloud' protocols. Thirdly, a small pilot study was established that emulated the procedures proposed for the main study. It is suggested by Dillman (2000) that between 100 and 200 respondents are needed for a pilot study to ensure that the survey is capable of measuring the variable correlations and the ability of the questions scale to give an indication of the response rate and overall duration of time. Checking for inadvertent typographical errors by someone who has no connection with the survey is an important part of the final revision process.

Dillman's (2000) suggestions were followed, and my supervisors reviewed the questionnaire and recommended that a filter question for an awareness variable was added, together with a change in the style of the questionnaire, by incorporating the Likert scale.

The think aloud protocols were conducted with friends, who suggested that the length of the covering letter be reduced in order to encourage a higher response rate. In addition, we found some spelling errors, and modified some of the wording of questions for better understanding, such as a suggestion for a question about social influence from one of my colleagues: "People who influence my behaviour think that I should use the e-government system".

The third step was conducted by distributing the questionnaire by using email and Facebook social network to friends, and then using a snowball technique to include more participants. The study received 136 respondents after two weeks since first posting the link. The correlation between variables was checked and ensured the capability of the question scale. The final stage was conducted by a person, unrelated to the survey, who checked the questionnaire for typographical errors.

## **Reliability and validity**

Reliability and the validity of the study are the most important evaluations of any form of social research. Such criteria become even more important when using positivist research methodology, when the need to ensure that when measuring personal attitudes, or using a

rating scale, respondents' views are measured consistently and accurately (Collis and Hussey, 2009). The reliability linked to the outcome of the research being repeatable, and whether it would achieve a similar result. Validity is related to the integrity of the conclusion of the research, and whether or not it has achieved what was intended, and measures the required concept.

Research validity comprises internal validity, construct validity and external validity (Bryman, 2008). The internal validity is about the causality and the reality of the relationship between the dependent and independent variables. In this research, the content is validated by determining variables that were already defined in previous literature, which were then used as constructs within previous developed models in information systems, social and psychological fields. These variables were validated within the study of e-government and e-business, together with culture values. Construct validity refers to the extent to which the constructs are correlated to measure the concept that underpins the research. Accordingly, this study applied factor analysis techniques to measure the factors' construct validity, in addition to identifying items that were considered to be appropriate for each dimension as a reduction tool. This study also utilised multiple regression tests in order to assess the association between variables. In addition, external validity is concerned with research result generalisation.

The reliability of this research is determined by using two techniques, the Cronbach coefficient alpha, which is the most common method of measuring the homogeneity among multi-point items, and the test re-test method by repeating the questions in a different form within the questionnaire. The Cronbach coefficient alpha value varies from 0 to 1, but good reliability should produce a coefficient value of at least 0.70 (Pallant, 2001).

## **Ethical Considerations**

Ethical considerations are one of the most important issues to be considered in this research, which includes the protection of participants from any harmful consequences as a result of the research activities. Issues of safety, well-being, anonymity, coercion, informed consent, data protection and the confidentiality the respondents are a high priority. This study has followed the University of Birmingham's Ethical Review Process, with the required documentation being submitted to the committee for approval.

A consent form was requested in the covering letter accompanying the questionnaire, with the participant being informed about the objectives of the research, as well as its intended contribution to field of research and wider society. In addition, to ensure the safety and privacy of the respondent, the survey will be used for academic purpose only. Individual confidentiality and anonymity will be respected and guaranteed, and no identification information required from the respondents; only the researcher has access to the data accumulated from the survey. Finally, the respondents were given the opportunity to withdraw from the survey without restriction at any time.

## **Conclusion**

This chapter explains design of the research, together with a detailed plan and structure for the study. It begins by examining the systematic literature review used in this study and then proceeds to the descriptive and explanatory parts of the research, which are adapted to the purpose of the study. This chapter examines various assumptions relating to research philosophy, and discusses the reasons for deploying the positivism philosophy in this study. This chapter describes different methods of research and compares their advantages and disadvantages. The quantitative method and deductive approach were selected as the most appropriate method to achieve the objective of the research. This research applied the survey method as a strategy for this study and selected questionnaires as the appropriate method of data collection. The research samples, together with justifications for the online mode of distributing the questionnaire selected are also discussed in this chapter.

The chapter has made use of a systematic approach to the research, following academic guidelines for designing, pre-testing and piloting the questionnaire. Research quality is considered by evaluating its validity and reliability. Finally, ethical consideration relating to the safety, confidentiality and anonymity of respondents are discussed, as well as confirmation that the study conforms to the ethical procedures established by University of Birmingham.

To conclude, both the methodology of the research, together with the research strategy have been discussed in this chapter. The following chapter will present and analyse the findings from the research.

# Chapter 6:

## Data Presentation and Analysis

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### Introduction

In the previous chapter, the strategy for this study was discussed along with its research philosophy that were adopted to create the research design, such as how the survey would be piloted, identifying the sample and the design of the questionnaire. The intention of this chapter is to continue to present the data collected and to provide an assessment of its reliability and validity, so that the model of factors can be evaluated that influence an individual's adoption of e-government, and, within the context of Saudi Arabia, how socio-cultural values moderate these.

First, this analysis will examine cleaning the data from inaccurate or missing data and outliers, as well as screening and coding the responses, before validating the normality of the data. Then the percentage statistics, mode, mean and frequency of the data will be set out to present descriptive statistics, and analysis of this descriptive data will include independent factors, dependent adoption variables and demographic variables. Subsequently, the reliability and validity of the data will be evaluated before advanced statistics are calculated. Then cause and effect relationships between variables will be evaluated by adopting inferential analysis, which will use factor analysis to load all correlated factors within one group. To carry out an assessment as to whether there is a significant correlation between the independent and dependent variables, a regression test will be carried out. There will also be an examination of the influence of moderated variables within independent factors relating to adoption.

To identify what factors influence citizens' adoption of e-government, this study has adopted an amended UTAUT model (Unified Theory of Acceptance and Use of Technology) that investigates social, technical and psychological factors that influence e-government adoption that are also moderated by cultural values. Saudi Arabia has been adopted as a case study, which should represent other developing Arab countries in the region, and to carry out a survey of citizens across a diverse area who also represent

different heterogeneous groups, and an online quantitative questionnaire was used. Facebook and other forums and social network websites commonly used in Saudi Arabian cities were used to post the online survey, which enabled unrestricted self-selected surveys and convenience sampling method.

This study has adopted the quantitative method, because Bryman (2008) argues that if findings are to be generalised to larger populations, then there is a need for objective and consistent judgments. Also, in attempting to expose perceptions and attitudes of citizens regarding a specific phenomenon, then the quantitative approach is valuable when quantifying personal belief. Saudi society is based on gender segregation, and is considered to be conservative; therefore, data collection for this research avoids direct contact with respondents, because this could have resulted in a gender bias in the data. This method was also determined to be the most appropriate as the survey would include respondents from different heterogeneous groups and with different characteristics, so that a large population sample could be used that would be spread across a large geographical area. A time limit of 6 weeks was adopted for posting the questionnaire on the selected social network websites, and 723 responses were received by the researcher at the end of this period.

## **Data Analysis: preliminary stages**

These stages led to selecting the strategy most appropriate for data analysis by cleaning the data, screening and pre-coding the responses (Churchill and Iacobucci, 2004). Numeric values were assigned to each characteristic as the pre-coding process, and then the SPSS statistical analysis software package (version 18) was used when the data collected on Microsoft Excel was transferred to this for further analysis. The next stage involved checking the data for normal distribution, outliers, accuracy and missing data by screening and cleaning processes. This chapter will present the analysis of this data to improve understanding of e-government adoption key predictors, as well as any variables that could moderate this relationship.

## **Cleaning and Screening Data**

### **Missing data and accuracy**

This stage was important, as the process of analysis could have been influenced if missing and inconsistent data had not been checked. It was necessary to modify the text responses for question 3 to numeric values, which related to different levels of education choices, such as diplomas, and then to discover any missing data, each variable was subjected to frequency tests. This resulted in 31 questionnaires revealing missing data, so that they could not be used, and completed questionnaires were also filtered to separate respondents with no previous knowledge of the system from those respondents that had used the system before with different types of questions after adopting the skip logic technique.

Questionnaires that had missing data were then no longer considered for further analysis, which related to around 4% of the total responses, and Malhotra (1999) describes this procedure for removing missing data as casewise deletion. Therefore, 692 completed questionnaires were considered to be usable for further analysis, which is an acceptable number of responses for this study.

## **Outliers**

When some data is revealed to be significantly different from most of the other response data, this extreme data is defined as outliers, which are important influencing factors as the outcome of the analysis could introduce a bias to the adopted model, as outliers could create bias for the mean and increase the standard deviation (Field, 2009). Also, normality of the data could be influenced by outliers when making critical assumptions from the regression test adopted for this study, so the data was screened by observing Z scores methods, a box-plot graph and with a histogram graph to reveal outliers (Field, 2009). Dependent on the quantity of cases within one variable, the classification of outliers is determined to be multivariate or univariate. In addition, 4 sections are adopted to categorise outliers based on distribution of the variables, sample errors, failure to specify missing values and incorrect entries (Tabachnick & Fidell, 2007).

Changing the score, transforming the data or removing the cases could solve the problems of outliers, and for this study, box-plot graphs and histograms were adopted to graph the data, so that outliers could be detected more clearly. Field (2009) suggests a statistics procedure that has been widely used, and has been adopted for this research, which involves quantifying 2.5 times the standard deviation from the mean, Tabachnick & Fidell (2007) suggest that cases could be investigated with standardised scores that are above 3.29.



The outliers revealed of cases from this study were dealt with by transforming the data, so that the adoption of e-government that were originally determined by proposed variables were recoded, so that they included the mean of the high loaded items of this specific variable when using the output score from the factor analysis test. Despite this transformation of data, cases of outliers should be expected from this research, because it is attempting to evaluate the behaviour of citizens regarding adoption of technology, and within different heterogeneous groups, this behaviour is likely to be varied. Therefore, the normal distribution of the data will have been positively influenced when the effects of the outliers were reduced by transforming the process of the variables, which will be examined in more detail in the following section.

### **Data Normality**

The average or mean and the variability or variance are the two elements that define normal distribution, and is usually represented as a bell-shaped symmetrical curve, and Field (2009) explains that in simple terms there is a symmetrical distribution of data around the centre of all scores. Prior to conducting a regression test or other multivariate analyses, normal distribution of data needs to be evaluated, as this is fundamentally important. The Q-Q plot (quantile-quantile) and histogram graph reveal that data from the research has a normal distribution of a curved line in two sides of the histogram, and for the Q-Q plot, a straight line passing across most of the data. Hair et al. (2006) confirms that this outcome supports the assumption that with a large sample size, the data is distributed normally.

Defining whether data is demonstrating a normal distribution could be subject to bias of the researcher, as subjective judgement will vary from one researcher to another, so on their own graphs cannot provide conclusive evidence for research findings. Therefore, for each variable, its values of kurtosis and skewness were evaluated to provide confirmation of the normal distribution of the data (Tabachnick & Fidell, 2007). The symmetry of the data could be skewed to the left with a tail pointing towards the right showing a positive skew, or the data could be skewed to the right with a tail pointing to the left showing a negative skew. In contrast, the peakness of the distribution is defined by kurtosis as normal when bell-shaped data is displayed, which is not flat or highly peaked. Therefore, when kurtosis and skewness have a zero value, then the data is distributed normally, but if the value is increased in negative or positive, then normality is decreased (Tabachnick and Fidell, 2007).

According to Hair et al. (2006), the specific criteria value should not be exceeded as a result of the kurtosis and skewness of the statistical value of Z, normally + or- 2.58 (with .01 significance level) and 1.96 (with .05 error level), so that data normality can be ensured. Several researchers have supported the notion that as long as the absolute value of kurtosis is less than 10 and the absolute value of skewness is less than 3, data is normally distributed (West et al., 1995; Hair et al., 2006). The results of the data analysis from this research study revealed there was an acceptable range of kurtosis (under 8) and skewness (under 2.5).

## **Descriptive Statistics**

Tabachnick & Fidell (2007) explain that variables or combinations of variables can be used to describe samples of subjects that are then defined as descriptive statistics. Therefore, charts, tables and other graphical forms are often used to display compact forms of summarised data from various tests that produce standard deviation, mean mode, percentage and frequency. For this study, these descriptive statistics will demonstrate the respondents' data in terms of e-government acceptance, e-government intention, Internet patterns and demographic profiles.

To detect and confirm hypotheses, descriptive statistics contribute to explaining ambiguities in raw data (Lovie, 1986; p.165). Therefore, the following section will examine some descriptive statistics before advanced analysis is adopted, such as regression test and factor analysis. A review of the literature revealed that Internet experience, levels of education, gender and age were factors that had a critical influence on whether individuals would adopt new technology, but this study evaluated characteristics of respondents that were diverse to reveal whether demographic variables could influence the adoption of e-government in Saudi Arabia by considering how cultural differences affect this.

### **Demographic profile**

The demographic profile was constructed by the first question that indicated the gender of the respondent, and the results showed that around 75% of the respondents were male, so that 515 respondents were male and 177 respondents were female, and shown in table 6.1. These findings were expected and discussed in previous chapters, because the nature of Saudi society is considered to be conservative.

Gender	Frequency	Per cent	Actual gender percentage in K.S.A
Male	515	74.4	50.9
Female	177	25.6	49.1
Total	692	100.0	100

**Table 6.1: Respondents' Gender.**

Findings relating to the ages of the respondents revealed that 40% were between 26 to 35 years old, 27.2% were between the ages of 36 to 50, 23.3% were aged between 18 to 25 years old, but only 5.6% were under 18. The age group over 50 years of age were represented by only 4.5% (see table: 6.2). This result reflects the median age of the actual Saudi population which is 25 years old. 28.2% of the total population under 14 years of age and with only 3% of the population over the age of 65 years, most of the population is between 15-64 years (The World Fact Book, 2013).

Age			
Age group		Frequency	Per cent
	Under 18	39	5.6
	18-25	161	23.3
	26-35	273	39.5
	36-50	188	27.2
	Over 50	31	4.5
	Total	692	100.0

**Table 6.2: Respondents' Ages.**

The educational levels of the respondents revealed that 62.6% (433) had a Bachelor degree from attending a university. 17.6% of respondents were the next largest group of education levels with a higher or secondary school certificate (122). 14.6% of respondents (101) had completed postgraduate degrees, such as PhD or Masters degrees. 5.2% of respondents held pre-secondary education levels (36) (see table: 6.3). The review of literature supports these findings and show that most citizens of Saudi Arabia are well educated, and this study has found that around 77% of the respondents have a degree at graduate or postgraduate levels. The average literacy rate in Saudi Arabia is 87.2%, with a higher rate for males (90.8%) and lowers for females (82.2%) (The World Fact Book, 2011).

Respondents' education levels			
Education level		Frequency	Per cent
	Pre secondary	36	5.2
	Secondary	122	17.6
	University	433	62.6
	Postgraduate	101	14.6
	Total	692	100.0

**Table 6.3: Respondents' levels of education.**

**Patterns of Internet Usage**

Two questions were selected for this survey to reveal patterns of Internet usage, and the first dealt with frequency of Internet use for participants, and the responses revealed a high adoption rate of the Internet. 84.2% (583) of respondents suggested that they used the Internet several times each day, and 8.1% of respondents (56) claimed they used the Internet about every two days. 3% of the respondents (20) were represented by two different groups: those that used the Internet once a week, and another group that used the Internet only a few times a month. 1.9% of respondents (13) claimed they used the Internet for less than once a month (see table: 6.4). These findings suggest that based on the responses from the participants of the survey, there is a high adoption rate of the Internet, and suggests a regular pattern of Internet use overall across society in Saudi Arabia. This pattern of high levels of Internet from the responses of these participants might be due to the larger numbers of young respondents discussed earlier.

How often do you use the Internet?			
		Frequency	Per cent
	Once a month or less	13	1.9
	A few times a month	20	2.9
	Once a week	20	2.9
	Every day or two	56	8.1
	Several times a day	583	84.2
	Total	692	100.0

**Table 6.4: Internet Usages.**

Data about patterns of Internet usage was also revealed by the second question that asked about years of experience of using the Internet, and 37.3% of respondents claimed they had over 10 years of Internet experience, and 34.1% of respondents said that they had used the Internet for between five and ten years. 16.8% (116) of respondents claimed they had used the Internet for between three and five years. 9.2% of respondents replied that they had used the Internet for between one to three years, and 2.6% of respondents (18) that represents the smallest group claimed they used the Internet less than once a year (see table: 6.5).

Therefore, these findings suggest that over 70% of respondents have used the Internet for more than five years, and the outcome of these findings suggests a positive dissemination of the Internet for these respondents, who have adopted this new technology over a long period of time. The actual number of Internet users in Saudi Arabia grew from around 1 million in 2001 to an estimated 15.2 million by the end of 2012 and Internet penetration increased to 52% of the population by the end of 2012 (CITC, 2012).

Internet experience			
		Frequency	Per cent
	<1 year	18	2.6
	1-3 years	64	9.2
	3-5 years	116	16.8
	5-10 years	236	34.1
	>10 years	258	37.3
	Total	692	100.0

**Table 6.5: Respondents’ internet experience**

### E-government adoption behaviour

To gain understanding of e-government adoption behaviour from this survey, the respondents were asked if they had previously heard about e-government, and their responses were used to filter the respondents in accordance with the answers. Those participants answering No were asked to skip the following part of the survey and to respond to the final part of the questionnaire, so that their lack of awareness could be evaluated. Those respondents answering Yes were invited to continue to respond to questions regarding adoption behaviour. The results revealed that around 70% of the respondents had previously heard about e-government systems (see table: 6.6). However, although awareness of the existence of e-government by respondents to be at a high percentage, this should not conclude that willingness or acceptance to use the system is guaranteed.

The findings reveal that about 60% of those who never heard of e-government are degree holders and 74.4% of them are regular users of the internet. These results also show that about 50% of female respondents had not previously heard of e-government, which could explain a lack of awareness of females of such projects or a general lack of interest in the e-government applications overall.

Previously heard about e-government			
		Frequency	Per cent
	Yes	486	70.2
	No	206	29.8
	Total	692	100.0

**Table 6.6: Previously heard about e-government**

The survey also sought to discover the means by which respondents found out about e-government and its importance to them, and the first question in this section asked respondents about the importance of browsing the Internet to learn more about e-government, government agencies, mass media channels and communicating with friends and families. The findings revealed by the descriptive analysis showed an average score of 4.5 for mass media channels, and an average score of 4.4 for government agencies. Learning about e-government from the Internet had an average score of 4.3, and an average score of 4.2 for interpersonal communication.

To reveal the most important channel for improving awareness of e-government systems when they are in the earliest stages of implementation, a paired samples t-test was carried out to determine if there was a difference in the mean scores that was statistically significant (table 6.8). The results of the test showed that between interpersonal communication and mass media channels the difference was statistically different [ $M=.256$ ,  $SD=.976$ ,  $t(483)=5.77$ ,  $p<.05$ ], and the results that compared interpersonal communication and government agencies [ $M=.205$ ,  $SD=1.1$ ,  $t(483)=4.1$ ,  $p<.05$ ]. Comparing browsing the Internet and mass media channels the difference was statistically different [ $M=.182$ ,  $SD=.919$ ,  $t(483)=4.35$ ,  $p<.05$ ], and when comparing Internet browsing and government agencies [ $M=.130$ ,  $SD=.951$ ,  $t(483)=3.01$ ,  $p<.05$ ]. These findings suggest that government agencies and mass media channels are more significant factors that contribute to learning more about e-government than compared to interpersonal communication and Internet browsing factors revealed by the respondents.

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Interpersonal communication – mass media channel	-.256	.976	.044	-.343	-.169	-5.774	483	.000
Pair 2	Interpersonal communication - Government agencies	-.205	1.102	.050	-.303	-.106	-4.083	483	.000
Pair 3	Interpersonal communication - Browsing the web	-.074	.992	.045	-.163	.014	-1.650	483	.100
Pair 4	Mass media channel - Government agencies	.052	.824	.037	-.022	.125	1.380	483	.168
Pair 5	Mass media channel - Browsing the web	.182	.919	.042	.100	.264	4.352	483	.000
Pair 6	Government agencies - Browsing the web	.130	.951	.043	.045	.215	3.011	483	.003

Table 6.7: Paired sample T-test Comparison of methods to learn about e-government.

Pallant (2005) explains that when the same sample of cases or subjects are taken and then measured at more than three points in time, or with less than three different conditions, the Friedman Test, which instead of a one-way repeated measure of analysis of variance, is a non-parametric alternative. The mean scores for this study are ranked by using the Friedman test (table 6.7) and confirm the research hypothesis that at the early stage of implementation, interpersonal communication is less important than mass media channels.

Variables	Mean Rank	Variables	Mean Rank
Mass media channel	2.66	Browsing the web	2.42
Government agencies	2.60	Interpersonal communication	2.32

**Table 6.8: Friedman Test Comparison of methods to learn about e-government.**

The measurement of dependent variables was examined from responses to the following question on e-government adoption that related to behaviour usage, intention to use e-government, e-government usefulness and e-government awareness. Pavlou & Fygenson (2006) defined a marketing theory that would confirm a new product’s adoption by beginning with target awareness, creating attitudes of consumers towards the product, which follows with a trial basis usage to encourage likely intention to use the product, and when this marketing theory is complete, the consumer accepts and is satisfied based on regular use of the product. This current research applies a similar approach to this marketing theory, as adoption of e-government is viewed as a continuous stage from being aware and perceiving that the system exists, which leads to believing that there are advantages of the system, but also having positive attitudes towards the system. This should then encourage citizens to have an intention to use the system, and finally actually use e-government systems, and satisfied and accepting that the services are useful and worthwhile.

A Likert scale was adopted to assess responses to questions that could measure their attitudes, beliefs and options, so that five scores for responses could be selected ranging from strongly agree to strongly disagree. E-government awareness showed a mean score of 3.9 for the statement relating to awareness of e-government services provided by the government of Saudi Arabia, so that around 50% of respondents either strongly agreed or agreed.

When responding to the statement regarding personal usefulness of e-government services, the average score was 4.68, so that 63% strongly agreed or agreed. Responses to statements to measure intention to use e-government services were covered by two

statements, where respondents planned to use these services in the future scored 4.70, and where respondents considered they could use these services in the future scored 4.47 as average scores.

The responses to behaviour usage varied with two statements, where responses to e-government services being a good idea scored 4.73, and liking to use e-government websites scored 4.68 as mean scores. As the main dependent variables for this research model were defined as usage behaviour and intention to use the services, the design of the survey included two statements for these measurements based on the UTAUT based model. All variables showed a mode of response score of 5 (strongly agree), but the mode of response score for the awareness variable was 4 (agree) based on the Likert scale which explain the participants’ awareness level of e-government system (see table: 6.9).

Statistics							
				Intention to use e-government behaviour		e-government usage behaviour	
		e-government awareness	e-government usefulness	Plan to use system	Intention to use system	Like to use system	Using system good idea
N	Valid	484	484	484	484	484	484
Mean		3.90	4.68	4.70	4.47	4.73	4.68
Mode		4	5	5	5	5	5

**Table 6.9: Adoption behaviour: descriptive statistics.**

The survey was designed to include questions that would filter the responses regarding whether e-government services had been used by the respondents before to determine independent variables for users and non-users of these systems. Those that had previously used these systems were then asked to complete the following part of the questionnaire to reveal what factors influenced their usage, but respondents who had not previously used the systems were asked to skip the following parts and were directed to a later part of the questionnaire that asked about their intention to use the systems at some time in the future. The results showed that 77% had previously used e-government systems, and 23% had not used the systems previously, and shown in table: 6.10. Approximately 68% of the participants who have never used the system have a degree qualification and 86% of them used the internet several times a day. Surprisingly, males account for 74% of those who never used the system before as the statistics confirmed that males have more awareness of the system.

The missing values in this question represent participants who stated that they are not aware of e-government in the previous question (number 6), so they skip this question.



E-government usage				
		Frequency	Per cent	Valid Per cent
<b>Valid</b>	Yes	373	53.9	77.1
	No	111	16.0	22.9
	Total	484	69.9	100.0
<b>Missing</b>	System	208	30.1	
<b>Total</b>		692	100.0	

**Table 6.10: E-government usages.**

Ten independent variables were evaluated in parts 3, 4 and 5 that related to influences for the adoption of e-government by respondents, so that forty statements were designed, and so 4 statements would measure each factor.

### Usage Behaviour: Factors

Factors influencing usage behaviour of e-government systems were defined by independent variables included in the third part of the survey, which were:

- System quality (SQ), such as continuation of service, customer service, functionality and system performance,
- Information quality(IQ), such the system’s overall performance from up to date, complete and accurate information provided,
- Trust (T)that can be expected and relied upon by groups and individuals,
- Availability of resources (AR) that are needed to adopt technology, such as Internet access and a computer, and
- Computer self-efficacy, (CSE) such as perception of knowledge and skills that are required to use and adopt e-government systems.

The Likert scale was used to assess the factors the influenced respondents’ usage of e-government services with 5 scores ranging from strongly disagree to strongly agree. The mean score for computer self-efficacy of the respondents ranged between 4.5 and 4.45, and this would be considered to be relatively high score. The mean score for the factor of trust ranged between 3.71 and 3.33. The mean score for the factor of information quality ranged from 3.41 to 3.69. The factor of system quality showed a mean score of 2.38 and after system shutdown, the score was recoded, as the statement was negative. The factor of relevant information showed a score of 3.41 (see table: 6.11 below). As the concept of e-government services in Saudi Arabia are relatively new, the number of responses showed levels of neutral scores.

	1	2	3	4	5	Mean/ percentage
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
I think that the government website has adequate security features.(T)	5 (2.07%)	8 (3.32%)	87 (36.10%)	92 (38.17%)	49 (20.33%)	3.71 / 5 (74.20%)
I think government agencies have the resources to perform dependable and reliable online services.(AR)	17 (7.05%)	52 (21.58%)	54 (22.41%)	70 (29.05%)	48 (19.92%)	3.33 / 5 (66.60%)
I have the skill to use e-Government websites. (CSE)	0 (0.00%)	4 (1.66%)	12 (4.98%)	85 (35.27%)	140 (58.09%)	4.50 / 5 (90.00%)
I am confident about using e-Government websites. (CSE)	1 (0.41%)	8 (3.32%)	12 (4.98%)	81 (33.61%)	139 (57.68%)	4.45 / 5 (89.00%)
Information provided at the government website is up-to-date.(IQ)	12 (4.98%)	28 (11.62%)	86 (35.68%)	70 (29.05%)	45 (18.67%)	3.45 / 5 (69.00%)
Information provided at the government website is accurate.(IQ)	9 (3.73%)	17 (7.05%)	69 (28.63%)	91 (37.76%)	55 (22.82%)	3.69 / 5 (73.80%)
Information provided at the government website is complete data.(IQ)	9 (3.73%)	40 (16.60%)	71 (29.46%)	80 (33.20%)	41 (17.01%)	3.43 / 5 (68.60%)
The government website provides all relevant information necessary to fulfil my needs. (IO)	11 (4.56%)	37 (15.35%)	72 (29.88%)	83 (34.44%)	38 (15.77%)	3.41 / 5 (68.20%)
The system is always suffering from shutdown problem.(SQ)	11 (4.56%)	19 (7.88%)	88 (36.51%)	67 (27.80%)	56 (23.24%)	3.57 / 5 (71.40%)
Online customer service is available at all times.(SQ)	25 (10.37%)	59 (24.48%)	90 (37.34%)	34 (14.11%)	33 (13.69%)	2.96 / 5 (59.20%)
The system provides continuous access to other .(SQ)	20 (8.30%)	35 (14.52%)	74 (30.71%)	78 (32.37%)	34 (14.11%)	3.29 / 5 (65.80%)

**Table 6.11: Factors affecting usage behaviour.**

## Intention Behaviour: Factors

This question includes the second part of the independent variables which are the factors that affect the intention to use behaviour of e-government system (Dependent variable). This intention to use behaviour is defined as the subjective probability of the respondents if they would carry out the behaviour, and these factors which affect the intention are:

- Social influence, such as measuring the social norm to accept e-government and how this influences intention behaviour in Saudi Arabia,
- Compatibility, such as how traditions, culture and lifestyle fit with these e-government systems,
- Effort expectancy, such as the complexity or ease of use of these systems, and
- Performance expectancy, such as measuring the benefits gained by using these systems.

A Likert scale was used to measure the respondents’ opinions of factors that could influence their use of e-government with 5 potential scores from strongly agree (5) to strongly disagree (1). Performance expectancy of saving time by using e-government revealed a high average score of 4.78, and for saving costs a score of 4.6. Effort expectancy showed average scores ranging from 3.98 and 4.27, and for the factor of system compatibility, the average score was 4.68 for offering women opportunities to use the online government services, and for face-to-face preference the score was 2.39. The factor of social influence showed average scores between 3.13 and 4.51 (table: 6.12).

Factors	Variables	Mean
Performance expectancy	Q11-1 accessing E-government system 24/7.	4.76
	Q11-2 Accessing E-government systems from anywhere.	4.75
	Q11-3 Accessing E-government system saving cost.	4.69
	Q11-4 Accessing E-government system saving time.	4.79
Effort expectancy	Q11-5 The website is flexible.	4.26
	Q11-6 The website is easy to interact with.	3.96
	Q11-7 The website is easy to navigate.	4.27
	Q11-8 The website is clear and understandable.	4.02
Compatibility	Q11-9 E- government system appropriate for my needs	4.43
	Q11-10 compatible with culture value	4.54
	Q11-11 chance for women to enrol with government services online.	4.68
	Q11-12 face to face preference	2.39
Social influence	Q11-13 People who influence my behaviour think that I should use e-government system.	3.7
	Q11-14 I will use e-government if important people to me use it	3.38
	Q11-15 People who used e-government have more prestige.	3.13
	Q11-16 I would use e-government if I needs to use	4.51

Table 6.12: Factor affecting intension to use behaviour.

### Awareness Behaviour: Factors

Independent variables influencing e-government adoption in the third part included responses from all participants, including those that claimed not to have heard of e-government previously, which were: Computer self-efficacy (CSE), Availability of resources (AR), Trust of the Government (TOG), and Trust of the Internet (TOI).

Trust is a critical factor influencing awareness behaviour, as trust of the Internet has to be associated with belief that it is a medium that can be depended upon, a secure and safe environment to carry out transactions, and trust of organisations and agencies that use the Internet are able to provide online services that are dealt with confidentially.

A Likert scale was used to measure the attitudes, beliefs and opinions of respondents with five scores that ranged from strongly disagree to strongly agree. Computer self-efficacy showed a high average score ranging between 4.40 and 4.51. Availability of resources showed a more variable average score that ranged between 4.0 relating to being able to access high speed Internet, and 4.49 relating to being able to afford a computer. The factor of trust showed an average score that ranged between 3.54 and 4.07. The factor of trust of government agencies showed a score of 3.52 relating to ability of staff, and 3.71 relating to the ability of agencies to carry out online transactions correctly (table 6.13).

	1	2	3	4	5	Mean/ percentage
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
I have the skill to use computer technology.(CSE)	1 (0.26%)	4 (1.03%)	16 (4.12%)	144 (37.11%)	223 (57.47%)	4.51 / 5 (90.20%)
I am confident about using computer technology.(CSE)	1 (0.26%)	5 (1.29%)	38 (9.79%)	137 (35.31%)	207 (53.35%)	4.40 / 5 (88.00%)
I can afford computer hardware (PC). (AR)	4 (1.03%)	11 (2.84%)	19 (4.90%)	110 (28.35%)	244 (62.89%)	4.49 / 5 (89.80%)
I can afford an internet connection. (AR)	5 (1.29%)	13 (3.35%)	33 (8.51%)	119 (30.67%)	218 (56.19%)	4.37 / 5 (87.40%)
I have adequate computer technology at home. (AR)	3 (0.77%)	15 (3.87%)	41 (10.57%)	113 (29.12%)	216 (55.67%)	4.35 / 5 (87.00%)
I always have access to a high-speed internet connection at home. (AR)	15 (3.87%)	30 (7.73%)	58 (14.95%)	123 (31.70%)	162 (41.75%)	4.00 / 5 (80.00%)
I belief that the internet is a dependable medium.(TOI)	9 (2.32%)	24 (6.19%)	60 (15.46%)	133 (34.28%)	162 (41.75%)	4.07 / 5 (81.40%)
I belief that the internet is a safe place to perform secure transactions.(TOI)	21 (5.41%)	44 (11.34%)	91 (23.45%)	117 (30.15%)	115 (29.64%)	3.67 / 5 (73.40%)
I would hesitate to provide personal or financial information to the website.(TOI)	26 (6.70%)	49 (12.63%)	91 (23.45%)	132 (34.02%)	90 (23.20%)	3.54 / 5 (70.80%)
In my opinion Government agencies are trustworthy. (TOG)	19 (4.90%)	36 (9.28%)	93 (23.97%)	136 (35.05%)	104 (26.80%)	3.70 / 5 (74.00%)
I belief of the capability of the agencies to perform online transactions faithfully. (TOG)	17 (4.38%)	38 (9.79%)	91 (23.45%)	136 (35.05%)	106 (27.32%)	3.71 / 5 (74.20%)
I belief of the ability of the staff to implement online services in a private manner.(TOG)	21 (5.41%)	46 (11.86%)	109 (28.09%)	136 (35.05%)	76 (19.59%)	3.52 / 5 (70.40%)

**Table 6.13: Factors affecting awareness behaviour.**

### Reliability test

The quantitative method requires that measurement instruments are evaluated in terms of their validity and reliability, so that the data collected needs in depth evaluation to expose any potential insufficiency, and to minimise any potential errors, so that the researcher can be confident about measurement accuracy. Previous research findings suggest that before a

validity test is carried out, the data should be subject to a reliability test (Hair et al., 2006), and Field (2009, p11) explains that reliability refers to "whether an instrument can be interpreted constantly across different situations."Therefore, reliability could be defined as measuring a concept consistently, so that research findings would be confirmed if the test was repeated. Three significant terms of reliability were defined by Bryman (2008), and stability formed the first term to ensure the measure remained stable over time and did not fluctuate, which was considered for this current research by measuring one variable with different elements in a test-retest method. Internal reliability was the second term to define whether the scale indicators were consistent. Internal reliability is measured by splitting the data into two halves, and the respondents' scores are calculated for each half, and then checked with the correlation, or the split-half method, but Field (2009) explains that there are limitations with this method due to the way the data was split.

Another method was suggested by Cronbach (1951), who proposed the Cronbach alpha test, which split the data and computed the correlation coefficient for each split, and is now commonly adopted to measure internal reliability, as it can calculate the average of all likely split-half reliability coefficients. A review of the literature defines an acceptable level of internal reliability as a computed alpha coefficient that varies between a perfect internal reliability (1) and no internal reliability (0). Other research findings have not presented overall agreement, and Hair et al. (1995) suggest 0.70 coefficient as good internal reliability, but Pallant (2001) argues that 0.60 coefficient is a good internal reliability. Four levels of reliability are suggested by Hinton et al. (2004), as low (0.50 and below), high moderate (0.50-0.70), high (0.70-0.90) and excellent (0.90 and above).

This research used the Cronbach alpha test to measure internal reliability, and the results revealed a value of 0.872, which reveals a high internal reliability coefficient (see table: 6.14).

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.872	0.883	40

Table 6.14: Reliability statistics for the model.

Inter-observed consistency was also used to test reliability relating to the behaviour classification and subjective judgment, and related to open-ended questions (Bryman, 2008). However, previous studies have validated the survey items for this research, so that this obstacle is overcome.

Table 6:15 illustrates Cronbach’s alpha values for the included items for each factor and for each construct. The results show consistency of the scale indicators, reliability of the data and homogeneity of the items.

Model constructs	Cronbach's Alpha	No Of Items
Information quality	0.848	4
System quality	0.710	4
Performance expectancy	0.824	4
Effort expectancy	0.885	4
Compatibility	0.786	4
Social influence	0.70	4
Availability of resources	0.843	4
Computer-self efficacy	0.714	4
Trust of the Government	0.718	4
Trust of the internet	0.712	4

Table 6.15: Cronbach's Alpha for the model constructs.

### Validity test

According to Bryman (2008), although data from responses could be reliable, low validity is revealed if the research does not measure what was intended, so that research findings could be worthless. Therefore, if data is not reliable, the data collected is not valid data, so that indicators or one indicator designed to measure a concept should measure that concept reliability, which defines validity. Bryman (2008) argues that gauging validity can be achieved in different ways, such as construct validity and face validity (content), as two distinct terms.

### Content validity

Content validity is defined by Straub et al. (2004, p 68) as "the degree to which items in an instrument reflect the content universe to which the instrument will be generalised."

The content of this research content is defined as face validity, and the researcher has validated the data by defining the variables identified, which have been reported in previous research studies. Prior to the final design of this research survey, and following the pre-tests and the pilot survey, some experts in the field of e-government reviewed the questionnaire, and confirmed the validity of the content of the questionnaire.

## **Construct validity**

According to Straub et al. (2004; p. 68), construct validity is "one of a number of subtypes of validity that focuses on the extent to which a given test/instrumentation is an effective measure of a theoretical construct". Therefore, the measurement needs to consider discriminant validity and convergent validity to achieve construct validity. Discriminant validity means to what extent factors measuring various constructs are unique, and convergent validity means to what extent the proposed factors measure the same construct are correlated (Hair et al., 2006; Malhotra, 1999). A technique commonly accepted to define the component of construct validity as correlated factors loaded as one factor is factor analysis, and in this study, correlation matrix test and factor analysis was used to reveal the construct validity of this research. Therefore, to ensure multiple items of statements measured the same factor, factor analysis was adopted.

## **Inferential analysis**

Examining the relationships of cause and effect between variables by testing hypotheses concerning population differences based upon measurements of subject samples is what is meant by inferential analysis (Tabachnick & Fidell, 2007). Inferential statistics is defined by Collis and Hussy (2009; p. 222) as "a group of statistical methods and models used to draw conclusion about a population from quantitative data relating to a random sample". Inferential statistics have been used in this research to enable factor analysis, correlation test and regression analysis to identify underlying factors, and then to examine the influence of these factors upon the adoption of e-government from the perspective of citizens in Saudi Arabia.

## **Factor analysis**

Duplicated or redundant data may be removed from a set of correlated variables and these associated variables then represented by a group of derived variables by using a data reduction tool known as factor analysis. Bryman (2008; p.161) commented that factor analysis is "employed in relation to multiple-indicator measures to determine whether groups of indicators tends to bunch together to form distinct cluster, referred to as factors". The factor analysis test can be divided into two main categories: the exploratory factor analysis (EFA) and the confirmatory factor analysis (CFA). The aim of EFA is to determine the nature of constructs that have an influence upon a set of responses, whilst the question whether a specific set of constructs influence responses in a predictable manner is examined by CFA (DeCoster, 1998).

In this study, exploratory factor analysis was used to split the multiple items measurement on the Likert scale that reveals factors affecting citizen's adoption of e-government. Factor analysis will examine the difference between a number of new factors added to the UTAUT, including system quality, information quality, trust of the government and trust of the system. In addition, the construct validity of the data will be confirmed by using factor loading and the correlation matrix between variables. EFA was chosen due to its ability to examine underlying patterns, determining groups of items that correlate together, classification of groups of factors, as well as generating a factor score used to represent constructs value for further analysis (DeCoster, 1998). Construct score values will be used within this research to determine the correlation of these independent factors and the adoption of the e-government dependent factor, by using regression analysis. A problem in multiple regression and factor analysis may be caused by multicollinearity, and the combination of variables that are collinear is used to overcome this issue (Field, 2009).

### **Preliminary analysis**

The suitability of sample size for conducting factor analysis is considered by Tabachnik and Fidell (2007), who conclude that in excess of 300 cases would be considered as an adequate sample, but communalities should be above 0.5 following extraction. Hair et al. (2006) claim that factor analysis requires a minimum of ten observations for each variable in order to avoid difficulties in computation, with a minimum sample of 50 observations. The sample size for this study is adequate for conducting factor analysis, because the size of the sample is in excess of 300 cases.

The Kaiser-Meyer-Olkin measure is an alternative method of checking sampling adequacy (KMO), which represents the ratio of the square correlation between variables to the square partial correlation between variables (Kaiser, 1970). The values of KMO vary between 0 and 1 as value close to 0 ensures that there is diffusion in the correlation, whilst a value close to 1 indicates a compact correlation pattern whereby the use of factor analysis is appropriate. Although Kaiser (1970) recommends an acceptance value greater than 0.5, Hutcheson and Sofroniou (1999) believe that a KMO value between 0.5 and 0.7 are mediocre, values between 0.7 and 0.8 are good, values between 0.8 and 0.9 considered as very good and values above 0.9 as excellent. The KMO value for this study is 0.813, which confirms the adequacy of the sample for factor analysis, with a significant value using Bartlett's test of sphericity of 0.000( $p < .01$ ) that is shown in the table (6.16) below.



KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Adequacy.	Measure of Sampling	.813
Bartlett's Test of Sphericity	Approx. Chi-Square	7569.841
	df	780
	Sig.	.000

**Table 6.16: KMO and Bartlett's Test.**

The checking of intercorrelations between variables before conducting factor analysis is advised by Field (2009) to ensure mild collinearity between variables. This advice is to guarantee a representative variable for factor analysis, as well as avoiding extreme singularity or multicollinearity between variables that disrupt the test of regression. The correlation matrix was scanned for variables that have a correlation below 0.3, followed by scanning of the correlation coefficients for values that were greater than 0.9 (Tabachnik and Fidell, 2007). The R-matrix determinant could then be used to identify multicollinearity as the value of the R-matrix should be greater than 0.0001 (Field, 2009). In this study, the value of the R-matrix is 0.000543, which is greater than 0.0001, and all questions correlated reasonably well in this study. The anti-image matrices were also checked for diagonals greater than 0.5, which refers to the KMO value for individual variables, with few residual (21 %) with values greater than 0.05, which represents the difference between the initial and the reproduced correlation between variables.

**Factor Extraction**

The Eigen values of the R-matrix were determined as the first part of the factor extraction process, which is the linear component within the data set. There are many components on the R-matrix, with as many variables of varying importance. The importance of these vectors is determined by the magnitude of the correlated eigenvalues. Kaiser’s criterion of retaining factors with Eigen values greater than one to ensure the inclusion of important factors, and extracting the others was used in this study (Field, 2009).

There are two dependent variables in this study that represent the adoption of e-government, the intention to use and usage behaviour. Independent variables were split into two groups for factor extraction, and in keeping with research theory.

The output of the intention to use groups revealed six factors with an Eigen value greater than one following extraction with a number of factors explaining the variance percentage. The first factor explained about 24.7% of the variance and the second factor explained 12% of the variance (see table 6.17). The total cumulative components explained approximately 66.5% of the data set variance.

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.433	24.696	24.696	5.433	24.696	24.696	3.096	14.071	14.071
	2.647	12.032	36.728	2.647	12.032	36.728	2.971	13.503	27.574
	2.360	10.725	47.453	2.360	10.725	47.453	2.958	13.446	41.020
	1.763	8.014	55.468	1.763	8.014	55.468	2.097	9.533	50.553
	1.306	5.936	61.403	1.306	5.936	61.403	1.913	8.697	59.250
	1.114	5.065	66.468	1.114	5.065	66.468	1.588	7.218	66.468

Table 6.17: Total variance explained for intention to use components.

The scree plot of the eigenvalue (Figure: 6.1) confirmed Eigen values over 1 for six factors, suggesting the inclusion of six groups of factors (Field, 2009).

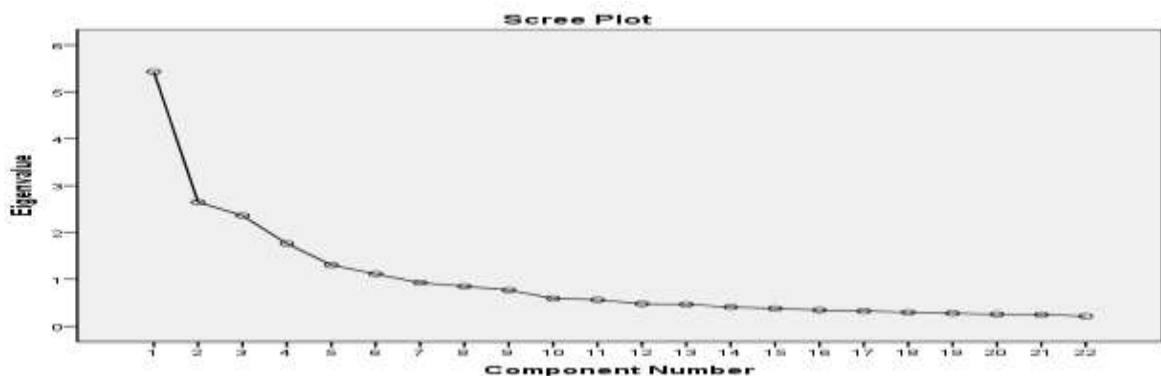


Figure 6.1: Eigen value for intention to use components.

Communalities that measure the proportion of the common variance, where extracted factors could be explained, are varied from 0.543 to 0.805, with an average communality of 0.669. Field, (2009) commented that the SPSS default option for extraction factor, which is the (Kaiser criterion for retaining factors with Eigen values greater than one), is acceptable if the sample exceeds 250 participants and that there average communalities is greater than 0.6. In this study, the Kaiser criterion of factor extraction is sufficient by extracting six factors as the sample size exceeded 250 participants and the average communalities is greater than 0.6.

Usage behaviour is the second dependent variable and the output revealed three factors that had an Eigen value of greater than (one) after extraction, with the percentage of variance factors explained. The first factor revealed in this data explained about 27.8% of the variance, whilst the second factor explained 24.2% of the variance. The third factor explained 8.4% of the variance (see Table: 6.18), and the total cumulative components explained approximately 60.5% of the data set variance.

Total Variance Explained										
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings			
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	
1	4.45	27.819	27.819	4.45	27.819	27.819	4.083	25.520	25.520	
2	3.87	24.235	52.054	3.87	24.235	52.054	3.79	23.699	49.218	
3	1.34	8.424	60.478	1.34	8.424	60.478	1.80	11.260	60.478	

Table 6.18: Total variance explained for using behaviour components.

The Eigen value scree plot (figure 6.2) confirmed that three factors have Eigen values over 1 (above the elbow), suggesting the inclusion of three groups of factors (Field, 2009).

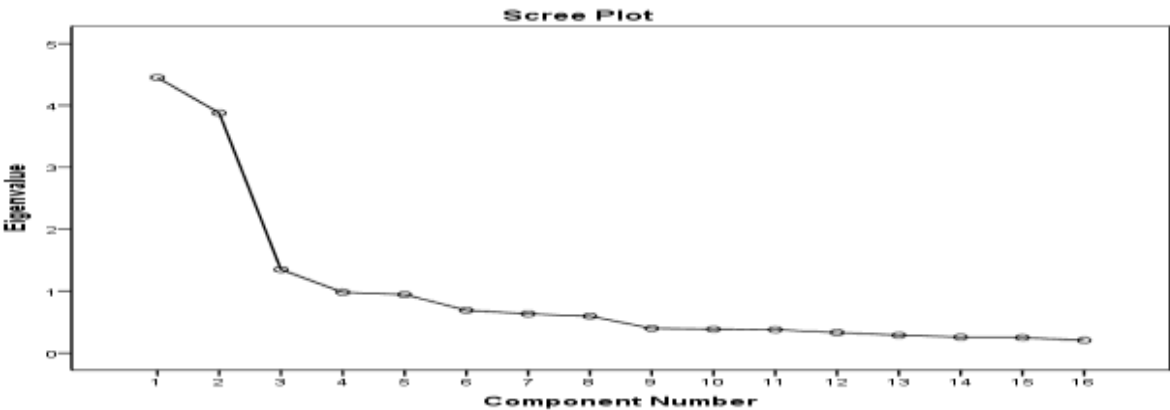


Figure 6.2: Eigen values for using behaviour components.

### Factor Rotation

A definition of the rotation is provided by Bryant and Yarnold (1995, p. 132) as “a procedure in which the Eigen vectors (factors) are rotated in an attempt to achieve simple structure.” In this study, a varimax rotation was chosen in order to maximize the relationship between variables by keeping the differential value constant for better interpretation (Gorsuch, 1983). Field (2009) recommended the use of orthogonal varimax rotation for uncorrelated variables, in order to maximize the dispersion of loading within factors. A reduced value of less than 0.5 was considered for factor loading, whilst the Anderson-Rubin factor score was selected to save independent factor scores.

The rotated components and how groups of components are loaded under one factor are shown in Table 6.19 below, which reveals the six components that influence intention to use behaviour. Most items loaded well under their proposed factor, with the exception of three items that cross-loaded and were discarded for further analysis. The first group of items are categorised under the effort expectancy (EE) factor and the second group are under the Trust of the government (TOG) factor. The third group of components were categorised under the performance expectancy (PE) factor, whilst the fourth group is referred to the compatibility (CM) factor. The fifth group refers to the social influence (SI) factor, whilst the sixth group related to the trust of the Internet (TOI) factor.

Rotated Component Matrix A						
	Component					
	1	2	3	4	5	6
I think accessing E-government system 24/7 is an important feature for me. (PE1)			.736			
I think accessing E-government system from anywhere is an important feature for me. (PE2)			.837			
I think Using e-government save me the cost .(PE3)			.682			
I think Using e-government save me time (PE4)			.770			
I would find the website flexible to interact with. (EE1)	.760					
Learning to interact with the website would be easy for me. (EE2)	.827					
It would be easy to navigate the website. (EE3)	.842					
Interactions with the website would be clear and understandable for me.(EE4)	.829					
I think E-government is appropriate for my needs. (CM1)				.799		
I think the e - government system is compatible with my religious aspects and cultural value. (CM2)				.744		
I think E-government offer a chance for women to enrol with government(CM3)				.688		
Using the website would fit into my lifestyle. (CM4)						
People who influence my behaviour think that I should use e-government system. (SI1)					.790	
I would use online government services if important people to me used them (SI2)					.788	
People around me who use the e-government system have more prestige.(SI3)						
I would use online government services if I needed to (SI4)						
I belief that the internet is a dependable medium. (TOI1)						.752
I belief that the internet is a safe place to perform secure transactions. (TOI2)						.685
I would hesitate to provide personal or financial information to the website. (TOI3)						.768
In my opinion Government agencies are trustworthy .(TOG1)		.843				
I belief of the capability of the agencies to perform online transactions faithfully. (TOG2)		.877				
I belief of the ability of the staff to implement online services in a private manner. (TOG3)		.751				

**Table 6.19: Rotated (Intention to Use) components.**

The second group of components, regarding usage behaviour, are loaded under three groups with some deletion of components due to cross or low loading as revealed in Table 6.20 below. Both information quality (IQ) factor and system quality (SQ) were loaded under one component in the first group. Both factors were merged under one component and referred to as service quality (SQ). The second group were loaded under availability of resource (AR) factor, with the third group of components considering the computer self-efficacy (CSE) factor. The independents variables were mostly based upon the UTAUT, whilst the components of these independent variables were mostly based upon previous literature.

Rotated Component Matrix B			
	Component		
	1	2	3
I have the skill to use computer technology (CSE1)			.760
I am confident about using computer technology (CSE2)			.784
Information provided at the government website is up-to-date. (IQ1)	.658		
Information provided at the government website is accurate. (IQ2)	.659		
Information provided at the government website is complete data. (IQ3)	.760		
The government website provides all relevant information necessary to fulfill my needs (IQ4)	.792		
The system is always suffering from shutdown problem (SQ1)			
Online customer service is available at all times. (SQ2)	.759		
The system provides continuous access to other resources. (SQ3)	.797		
The system provides Integrated services. (SQ4)	.801		
I have the skill to use e-Government websites. (CSE3)			0.735
I am confident about using e-Government websites. (CSE4)			0.687
I can afford computer hardware (PC) (AR1)		.819	
I can afford an internet connection. (AR2)		.868	
I have adequate computer technology at home. (AR3)		.877	
I always have access to a high-speed internet connection at home. (AR4)		.681	

**Table 6.20: Rotated (Using behaviour) components.**

SPSS was used to generate the factor scores for the nine independent constructs, with these scores representing the value of underlying constructs for further analysis (DeCoster, 1998). A frequency test was used to provide a descriptive analysis to check the normal distribution of the nine independent factors. Items used for the dependent variables were manually calculated from the intention to use and usage behaviour dependent variables. Six factors were identified in the factor analysis that proposed to influence the intention to use e-government, and four factors that proposed to affect e-government usage. The examination of the relationship between these nine constructs independent variables and the adoption of e-government as dependent variables using the regression test is the next stage of the process.

## **Regression analysis**

One statistical technique that is designed to examine the relationship between dependent variables with one or more independent variables is regression analysis (Field, 2009). The regression procedure is often used to identify independent variables that are related to the dependent variable. The regression technique estimates the magnitude of the effect of the independent variables upon the dependent variable (Tabachnik and Fidell, 2007). In this study, the regression analysis was chosen to examine the relationship between the dependent variable of the e-government adoption with the independent variable, which is influencing the adoption.

The regression analysis offers a variety of methods of use according to the measurement scale and the type of dependent variable. These are linear, logistic and ordinal regression that relate to the continuous, binary and order scale of the dependent variable (Tabachnik and Fidell, 2007).

Two dependent variables are used in this study which are the intention to use and usage behaviour, and the continuous scale is generated by calculating the mean of the categorical ordinal items. The multiple regression method was selected as an appropriate method for investigating the factors that influence the adoption of e-government in Saudi Arabia. Estimating the residual relationship between one dependent variable with one or more independent variables is the key assumption of multiple regression (Field, 2009). “The residual scatter’s plot provides a test of the assumptions of normality, linearity and homoscedasticity between predicted dependent variables scores and errors of prediction” (Tabachnik and Fidell, 2007; p 119). The residual, which refers to the difference between obtained and predicted dependent variables was plotted in this study, which reveals a straight line relationship with a normal distribution of dependent variable scores, and the variance of the residual is the same for all the predicted scores.

The first dependent variable is the intention to use e-government, which is suggested to correlate with performance expectancy, compatibility, effort expectancy, awareness of the system, social influence, trust of the government and trust of the Internet. The outcome reveals that the independent variables explain about 25 per cent of the dependent variable (intention to use e-government) with R-square equal to 0.251 (see Table: 6.21).

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.436	.251	.205	.55353	.251	8.506	7	469	.000

**Table 6.21: Intention to use behaviour (Model summary).**

The outcome of the ANOVA test (Table: 6.22) confirmed the model’s best fit, which could predict a better outcome than using the mean with the ratio of improvement reached  $F=8.506$  and significant value equal  $0.000(p<.05)$ .

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	18.242	7	2.606	8.506	.000
	Residual	143.699	469	.306		
	Total	161.941	476			

**Table 6.22: Intention to use behaviour (ANOVA Test).**

The relationship between the dependent variable, the intention to use the e-government system, and the independents variables was demonstrated through the  $\beta$  value and the significance of the T-test. Performance expectancy is shown to be correlated significantly with the intention to use e-government with a  $\beta$  value that is equal to .273 and with a significant value equal  $0.000(p<.05)$ . Trust of the Internet is shown to correlate significantly with the dependent variable with B value equal to .108 and significant value equal  $0.001(p<.05)$ . There was no significant correlation between the dependent variable (intention to use) and other independent variables, such as effort expectancy, compatibility, social influence, awareness of the system, and trust of the government (see the regression coefficients Table: 6.23). The results indicate that citizens’ belief of gaining benefits by using e-government applications and their confidence in using Internet services will encourage citizens to use e-government services in the future.

Coefficients a											
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	2.479	.312		7.933	.000					
	Performance expectancy	.273	.069	.193	3.984	.000	.253	.181	.173	.803	1.245
	Effort expectancy	.028	.043	.034	.647	.518	.160	.030	.028	.671	1.490
	compatibility	.013	.045	.015	.280	.779	.140	.013	.012	.697	1.434
	Social influence	-.003	.028	-.005	-.112	.911	.049	-.005	-.005	.901	1.110
	e-government awareness	.039	.029	.064	1.381	.168	.141	.064	.060	.894	1.118
	Trust of government	.018	.033	.029	.553	.580	.172	.026	.024	.709	1.410
	Trust of internet	.108	.032	.174	3.397	.001	.244	.155	.148	.718	1.392

**Table 6.23: Regression analysis coefficients for intension to use behaviour.**

It was suggested by Hair et al. (2006) that the use of simple correlations between each independent variable and the dependent variable assists in understanding the relationship between variables. Further analysis was therefore carried out to investigate insignificant correlations between the dependent variable (intention to use e-government) and the independent variables (effort expectancy, compatibility, social influence, trust of the government and awareness of the system).

A moderate correlation between performance expectancy and compatibility is shown by the Pearson correlation, indicating .408 with a significant value ( $p < .05$ ). A moderate correlation between performance expectancy and effort expectancy is revealed by the Pearson correlation, which reaches .276 with significant value ( $p < .05$ ).

A high correlation between effort expectancy and compatibility was revealed by the Pearson correlation, which stood at .458 with significant value ( $p < .05$ ). On the other hand, the Pearson correlation between trust of the government and trust of the Internet accounts for .509 with the Pearson correlation, with significant value ( $p < .05$ ) as table: 6.24 shown below. An indirect relation between the dependent and the independent variables is predicted by this moderate correlation through other independent variables (Lean et al., 2009). Independent variables, such as compatibility, effort expectancy, trust of the government and the awareness of the system have a significant correlation with the dependent variable, performance expectancy and trust of the Internet that reduce the correlation shown on the regression model. This indicates that citizens consider the ease of using the system, system compatibility with their life style, culture and traditions as system benefits. In addition, users might consider the trust of the government prior to Internet trust, because e-government is the only available method of contacting government agencies.

However, the correlation between the effort expectancy and computer self efficacy was not determined in this study because both constructs were assumed to influence different dependent variables. Effort expectancy was hypothesised to influence intention to use behaviour while computer self efficacy was proposed to affect the usage behaviour directly as the based models suggested.



Correlations									
		performance expectancy	effort expectancy	compatibility	social influence	Trust of government	Trust of internet	e-government awareness	dependent plan
performance expectancy	Pearson Correla	1	.276	.408	.100	.173	.171	.155	.253
	Sig. (2-tailed)		.000	.000	.029	.000	.000	.001	.000
effort expectancy	Pearson Correla	.276	1	.458	.280	.288	.246	.245	.160
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000
compatibility	Pearson Correla	.408	.458	1	.106	.185	.123	.074	.140
	Sig. (2-tailed)	.000	.000		.020	.000	.007	.108	.002
social influence	Pearson Correla	.100	.280	.106	1	.126	.048	.184	.049
	Sig. (2-tailed)	.029	.000	.020		.006	.295	.000	.285
Trust of government	Pearson Correla	.173	.288	.185	.126	1	.509	.157	.156
	Sig. (2-tailed)	.000	.000	.000	.006		.000	.001	.001
Trust of internet	Pearson Correla	.171	.246	.123	.048	.509	1	.195	.225
	Sig. (2-tailed)	.000	.000	.007	.295	.000		.000	.000
e-government awareness	Pearson Correla	.155	.245	.074	.184	.157	.195	1	.175
	Sig. (2-tailed)	.001	.000	.108	.000	.001	.000		.000
dependent plan	Pearson Correla	.253	.160	.140	.049	.156	.225	.175	1
	Sig. (2-tailed)	.000	.000	.002	.285	.001	.000	.000	

Table 6.24: Correlations for intension to use factors.

Usage behaviour is the second dependent variable is that is suggested to correlate with intention to use, computer self-efficacy, availability of resources and service quality as independent variables. A multiple regression test revealed that the model of independent variables explained about 34 per cent of the variance in the dependent variable with R-square equal to 0.343, and to which this result made a significant contribution (see table: 6.25 below).

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.585	.343	.335	.42944	.343	47.700	4	366	.000

Table 6.25: Usage behaviour (module summary).

The ANOVA test (table: 6.26) confirmed that the model is significantly better at predicting the outcome than the mean (best fit of the model) with  $F=47.700$  as the improvement ratio when predicting the outcome and significant value equalling  $0.000(p<.05)$ .

ANOVA b						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	35.187	4	8.797	47.700	.000
	Residual	67.499	366	.184		
	Total	102.686	370			

**Table 6.26: Usage behaviour (ANOVA Test).**

The relationship between the dependent variable, which is usage behaviour of the e-government system and the independent variables, were revealed through the  $\beta$  value and the significance of the T-test. A significant relationship between the intention to use and the usage behaviour was confirmed by this model with B value equal to .500 with significant value ( $p<.05$ ). There is also a significant correlation between computer self efficacy and the usage behaviour with  $\beta$  value equal to .333 with significant value ( $p<.05$ ). Usage behaviour correlates significantly with the availability of resources factor with  $\beta$  value equal to .138 with significant value ( $p<.05$ ). Intention to use variable is confirmed by the  $\beta$  value, which is the strongest predictor of usage behaviour followed by computer self-efficacy and availability of resources factors respectively. The correlation between usage behaviour and service quality variable is insignificant as revealed in table 6.27 below.

Coefficients a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.551	.280		5.533	.000
	Intention behaviour	.500	.044	.505	11.436	.000
	Availability of resource	.138	.045	-.157	-3.058	.002
	Computer self efficacy	.333	.060	.290	5.565	.000
	Service quality	-.005	.034	-.006	-.145	.885

**Table 6.27: Regression analysis for usage behaviour.**

The results obtained reveal digital divides issues, and that computer knowledge, skills and adequate tools, such PC and an affordable Internet network, as well as intention behaviour determines users’ attitudes to use a system of e-government.

**Moderated Demographic variables**

Three procedures are contained within a general linear module (GLM), which are regression, the analysis of variance (ANOVA), and the analysis of covariance (ANCOVA) that were deployed within this section in order to predict the effect of the dependent variable on one side with an interaction between two independent variables on the other, which is also called factorial ANOVA (Field, 2009). This analysis checked demographic variables including age, gender, education level and experience of the Internet, which could moderate the relationship of independent variables towards the adoption of e-government and confirm the hypotheses proposed.

The test examined the proposed hypothesis that gender will influence performance expectancy upon behavioural intentions to use e-government services in Saudi Arabia. In order to assess the homogeneity of the variance, Levine’s test of equality was carried out (Field, 2009). The Levine’s test revealed an insignificant outcome ( $F=.004, P>.05$ ) (table: 6.28) that confirmed that the error variance of the dependent variable is equal across the groups.

Levene's Test of Equality of Error Variances			
Dependent Variable: dependent plan			
F	df1	df2	Sig.
.004	1	475	.951

**Table 6.28: Levene's test of equality performance expectancy factor.**

Gender and performance expectancy interaction is significantly influenced by the dependent variable, intention to use e-government, as males are influenced more by performance expectancy towards adoption with F-ratio equal to 16.360 and significant value equal  $0.000(p<.05)$  as table: 6.29 below explained. The dominance of men over women in social roles, and especially in Saudi Arabia, reveals that men are more interested in accomplishment than women.

Tests of Between-Subjects Effects					
Dependent Variable: dependent plan					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	10.457	2	5.228	16.360	.000
Intercept	29.928	1	29.928	93.644	.000
Gender * performance expectancy	10.457	2	5.228	16.360	.000

**Table 6.29: Gender\* performance expectancy effect.**

GLM was conducted to assess the projected hypothesis that the influence of the system’s trust towards the intention to use e-government services in Saudi Arabia will be moderated by experience of the Internet. The outcome revealed the insignificance of the Levine test ( $F=.251$ ,  $P>.05$ ) (table: 6.30), which confirmed that the error variance of the dependent variable is equal across the groups.

Levene's Test of Equality of Error Variances			
Dependent Variable: dependent plan			
F	df1	df2	Sig.
.251	4	479	.909

Table 6.30: Levene's test of equality (trust of the internet factor).

Internet trust and Internet experience interaction is significantly influenced by the intention to use e-government (dependent variable) with an F-ratio that is equal to 5.292, and significant value equal 0.000( $p<.05$ ). See table: 6.31 below. This result revealed that people with less experience of the Internet are more reluctant to adopt e-government services than users with greater experience.

Tests of Between-Subjects Effects					
Dependent Variable: dependent plan					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	9.277	5	1.855	5.292	.000
Intercept	402.138	1	402.138	1147.021	.000
Internet experience * trust of internet	9.277	5	1.855	5.292	.000

Table 6.31: Internet experience \* trust effect.

GLM test was carried out to consider the effect of the moderated variables among the insignificant factors, such as social influence, effort expectancy, compatibility and trust of the government. Gender differences moderating effort expectancy, compatibility and social influence factors towards the adoption of e-government were hypothesised in the study. Effort expectancy and social influence affect the intention to use e-government services in Saudi Arabia, and will be moderated by experience of the Internet. More experienced Internet users are more confident in adopting the e-government system. The study also determined that behavioural intentions to use e-government services in Saudi Arabia from social influence are moderated negatively by level of education and age. Levine’s test of equality was used to determine the homogeneity of the variance (Field, 2009). The Levine test revealed insignificant outcomes ( $F=.790$ ,  $P>.05$ ) (table: 6.32), which confirmed that the error variance of the dependent variable is equal across the groups and the robustness of the significant test.

Levene's Test of Equality of Error Variances			
Dependent Variable: dependent plan			
F	df1	df2	Sig.
.790	75	401	.893

Table 6.32: Levene's Test of Equality.

The significance of the predictions to the model are revealed by the size of the F-ratio and the significance of the P value, which shows that education levels moderate the social influence factor towards the intention to use e-government services ( $p<.05$ ). Males and females respond differently to the complexity of the system. Internet experience moderates social influence, effort expectancy and trust of the Internet contributes towards the intention to use e-government ( $p<.05$ ). Table: 6.33 demonstrates that there was insignificant interaction between other moderated variables and independent factors, including gender compatibility, gender social influence and age social influence ( $p>.05$ ).

Tests of Between-Subjects Effects					
Dependent Variable: intention to use					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	13.124 <sup>a</sup>	21	.625	1.911	.009
Intercept	109.655	1	109.655	335.262	.000
Gender * effort expectancy	.097	1	.097	1.298	.000
Internet experience * effort expectancy	2.139	4	.535	1.635	.001
Gender * compatibility	1.221	2	.610	.866	.500
Gender * social influence	.078	1	.078	.237	.627
Age * social influence	1.717	4	.429	1.312	.264
Level of education * social influence	2.359	3	.786	2.405	.003
Internet experience * social influence	2.302	4	.575	1.759	.002
Error	148.818	455	.327		
Total	10221.250	477			
Corrected Total	161.941	476			

**Table 6.33: Independent factors\* moderated variables.**

Men are shown to be more influenced by performance than women when adopting e-government in the parameter that estimates that women are influenced more by the ease of use of the system than men. Internet experience and education levels negatively affect the social influence factor towards the intention; as the level of Internet experience or education levels increased, social influence decreased. Experience of the Internet positively influences the effort expectancy and factors relating to Internet trust. More experienced Internet users are more confident in adopting the e-government system.

This study includes the hypothesis that experience of the Internet moderates computer-self efficacy influences towards the usage of e-government behaviour (dependent variable). GLM was performed to determine the effect of the interaction of Internet experience and computer self efficacy towards usage behaviour. The Levine’s test revealed insignificant outcomes ( $F=.785$ ,  $P>.05$ ) (table: 6.34), which confirmed the error variance of the dependent variable is equal across the groups that meet the homogeneity assumption of variance (Field, 2009).

Levene's Test of Equality of Error Variances			
Dependent Variable: dependent usage			
F	df1	df2	Sig.
.785	4	479	.536

Table 6.34: Levene's test of equality for computer –self-efficacy factor.

The interaction of the computer – Internet experience and self efficacy - has a significant influence upon usage behaviour (dependent variable), with the F-ratio equal to 6.792 and significant value equal 0.000( $p<.05$ ) that is revealed in Table: 6.35 below.

Tests of Between-Subjects Effects					
Dependent Variable: dependent usage					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	10.458	5	2.092	6.792	.000
Intercept	87.349	1	87.349	283.648	.000
internet experience * computer self efficacy	10.458	5	2.092	6.792	.000

Table 6.35: Internet experience \* computer self –efficacy effect.

Conclusion

The main aim of this chapter is to present and analyse the survey data that reveals the key factors that have an impact upon the adoption of e-government from citizens’ perspectives within Saudi Arabia. This chapter commenced with a basic analysis to assess the consistency of data by identifying the outliers, missing data and the assumptions of normal distribution.

Data accuracy was checked, and in some cases was manipulated or deleted in order to ensure accurate analysis. The chapter continued by presenting some basic descriptive analysis in order to support data understanding and the selection of appropriate inferential statistics.

Most of the participants are revealed in the descriptive analysis as being young males with a high level of education and who have good Internet experience. This result confirmed that mass media channels and government agencies are greater influence factors when learning about e-government than browsing the web and factors of interpersonal communication.

A high internal reliability with overall Cronbach Alpha Value of more than 0.872 was confirmed later in the chapter. Data validity was examined and confirmed by conducting factor analysis, which validated the original proposed model by removing six factors that hypothesised the influence of intention to use behaviour and three factors that affect behaviour usage.

A regression test was conducted and the result revealed that both trust of the Internet and performance expectancy significantly influence the intention to use e-government. Behaviour intention, availability of resources and computer self-efficacy significantly affect behaviour usage. In addition, in the sample, resource availability was the only predictor of e-government awareness.

Finally, the interaction between the moderated values and independent variables confirmed the view that males and females respond differently to the benefits of the system (performance expectancy) and the intention to use e-government services. Males and females respond differently to system complexity that affects their intention to use e-government services. Education levels and experience of the Internet also moderate social influences negatively towards the behaviour intention. Those with high education levels or those with more Internet experience have little influence upon society to adopt e-government applications. Experience of the Internet moderates effort expectancy and Internet trust factors towards the intention to use e-government. More experienced Internet users are more confident in adopting the e-government system.

Conversely, the interaction of the computer self-efficacy and Internet experience has a significant influence upon e-government usage behaviour. Those greater experiences of the Internet usually have the skills and knowledge to use the system of e-government. The next chapter will discuss the study findings and interpret the results by considering the literature review and the base models of technology adoption.

# Chapter 7: Discussion

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## **Introduction**

The findings from the survey of the study validated the conceptual model, based on UTAUT, which were presented and analysed in the previous chapter. Advanced statistical techniques were deployed in the previous chapter to evaluate the research hypotheses by using the regression test. The investigation of the key factors that influence intention to use behaviour, and the usage behaviour of e-government was the main objective of this study. UTAUT was validated by the study in Saudi Arabia, and has extended the theory through the inclusion of additional variables, such as compatibility, trust, awareness and service quality that may influence citizens' adoption of e-government in Saudi Arabia.

This chapter seeks to discuss and interpret the findings by using the results of this study, together with the conclusions found in earlier literature. The chapter will make use of descriptive outcomes in order to provide additional explanations and clarity to the findings discussed. The moderated variables that are shown on the descriptive analysis explain a variety of influences among the main independent factors, which affect the adoption of e-government in Saudi Arabia. Such differences describe the variety of cultural values prevalent in Saudi society that moderate the adoption of e-government.

This chapter commences with a general discussion of the research findings, leading to a discussion of the proposed hypotheses results, before finally presenting the research model.

## **Discussion of the Findings**

Various organisational, political, technical and social issues that influence the implementation of an e-government system were discussed within Chapter Two.

Chapter Three explored factors that could promote or hinder the implementation and adoption of e-government services by citizens through highlighting social, cultural, geographical, technical, political and economic issues together with other characteristics within Saudi Arabia.



A strong economy, supported by the fastest growing ICT market in the Middle East should motivate the country to adopt e-government services. Additionally, the support of a large youth population with high education levels is likely to overcome the barriers of resistance to change. The climate in Saudi Arabia creates very high temperatures across the country, which is a further factor to encourage citizens to avoid visiting government offices and choose to use e-government services instead. The country is also important as a place of pilgrimage for Muslims across the World, which also requires government departments and agencies to use advanced systems in order to coordinate large numbers of pilgrims. The support from the King and senior government ministers is another important factor that encourages the implementation of e-government, as well as the project's clear vision and strategy (Al-Shehry et al., 2006).

Conversely, various technical factors, such as re-engineering processes, a reliable network, accountability, e-services that are secure and safe, modern and unified infrastructure that is lacking over a large area, together with a lack of trust could hinder the implementation of e-government services. The implementation process could also be negatively influenced by organisational factors, such as inadequate e-services regulations, judiciary requirements, lack of partnership and cooperation between government agencies and with the private sector, lack of IT professionals and government employees and citizens who lack technology skills, and insufficient awareness of e-government services by citizens and government employees (Al-Shehry et al., 2006; Gartner, 2007).

Comments from participants at the end of the questionnaire support earlier literature relating to the issues surrounding e-government adoption from the perspective of citizens. Moreover, these comments were useful in supporting the study finding as they emphasised the problem of the digital divides, trust as well as the compatibility of the system to the conservative society. Some comments suggest that the digital divide is an essential barrier preventing effective adoption of e-government services by government employees as well as citizens. Respondents suggest that government employees' lack of knowledge and computer skills as the main obstruction, together with the lack of adequate resources, such as efficient PCs and high speed Internet in the government agencies. The digital divide and lack of facilitating conditions at government departments is suggested by one participant as hindering the trust among citizens to adopt the system. Another respondent also commented

*“From my experience, government employees in Saudi Arabia are too lazy and unhelpful, so the question that should be asked is: Do you think that government employees will be trusted to do the work through the Internet? Otherwise, you have to encourage them by going and asking about your case!”*

Saudi society is strongly influenced by tribal systems, collectivism and religious adherence, potentially leading to resistance to change. However, e-government could be compatible if cultural issues are taken into account during the promotion of e-government services.

The problems associated with the low response of citizens to the adoption of e-government in developing Arab countries, with a main focus upon the Kingdom of Saudi Arabia is the aim of the study. It is therefore necessary to design an efficient method for evaluating the success of the implementation prior to the adoption phase. This new innovation should be designed according to the wishes of citizens, whilst taking into account the cultural, religious, traditional and other beliefs to ensure the widest possible adoption of this innovation.

Chapter Four used theoretical investigation in order to determine the factors that affect the adoption of e-government from the perspective of citizens. This is fulfilled by investigating technical, social and psychological factors, moderated by cultural values, which influence e-government adoption.

Chapter Six commenced with a preliminary data analysis stage that includes data screening and cleaning by checking the accuracy and the missing data. The data was then checked for outliers to ensure the normality of the data. There were 692 completed and adequate responses to the study, comprising 177 responses from females and 515 responses from males. The female participants account for approximately 25 % of the total participants involved in the survey. One explanation for this gender difference is due to the culture of the Saudi Arabia as a conservative society, with females displaying a lack of interest in the subject, and depending upon male relatives to deal with government transactions, as discussed earlier within the section relating to the culture values of the country. 90 per cent of the total numbers of participants were aged between 18 to 50 years old. This is representative of the actual age distribution of the country, which has an average age of 25 years old.

These findings suggest a greater acceptance of change and new technology among the youth population in contrast to older people. 62.6 % of the total participants hold a Bachelor degree, and 14.6 % of the respondents are postgraduates, which reflect an educated society with an interest in new innovation. Earlier studies confirmed that young adults with higher education income levels are more likely to adopt e-government services (Hart-Teeter, 2003; Shelley et al., 2004; Thomas & Streib, 2003 and Al-Ghaith, 2010).

84.2 % of respondents claimed that they made use of the Internet several times a day, with 8 % browsing the Internet every day or two. This result reveals that 37.3 % of the total number of participants has more than ten years experience of using the Internet, and 34.1 per cent of participants have between five to ten years experience. The high adoption rate of Internet use among survey participants reflects the Internet usage pattern within Saudi society, and is confirmed by this result. The number of Internet users increased from around 1 million in 2001 to an estimated 16 million by the end of 2012, with Internet penetration increasing to 55% of the population by the end of 2012. Increased public awareness, decreasing costs of personal computers and laptops, growth in broadband availability, Internet enabled handheld devices and Internet access are attributed as being behind the rapid growth of Internet users in Saudi Arabia. In addition, increased consumer ICT literacy, understanding of the value of Internet in both personal and business life, availability of local content, Arabic language sites, and e-services, such as online banking, e-commerce, and e-government applications, have all had a significant impact upon raised adoption levels and Internet use (CITC, 2012).

Approximately 70 % of the total number of survey participants stated that they had heard about the concept of e-government before. In addition, about 60 % of those who had never heard of e-government were holders of degrees, with 74.4 % of them being regular Internet users. It is also interesting to note that more than half of the female respondents have never heard of e-government services, which indicates that there is a lack of e-government awareness among those students using the Internet, and especially among females in Saudi Arabia. Mass media channels and government agencies are also confirmed by the respondents as more important factors when learning about e-government services than web browsing and interpersonal communication factors. This result could be due to the early stages of implementation, which required support from the media to disseminate the information to society. 77 % of participants had used the e-government system, only 23 % had not used the system before. 68 % of participants who had not used the system had a

degree qualification, with 86 per cent using the Internet several times a day. This result suggests that an awareness of the existence of system alone is insufficient to influence citizens' attitude to use e-government services, which requires greater awareness of the ways that the system can be of benefit to users. It was surprising to note that males account for 74 % of those who have never used the system, indicating the compatibility of the system for females in Saudi Arabia. Survey participants scored an average of 4.7/5 for the statement that "e-government is compatible for women to enrol with government services online in Saudi Arabia".

The regression analysis reveals that performance expectancy is the strong predictor of the intention to use e-government services, followed by trust of the Internet. This result was expected, because Saudi culture has a high uncertainty avoidance value and a lack of sense of time that an e-government system could overcome.

The compatibility factor reveals an indirect relationship with the intention to use e-government services through performance expectancy. No correlation between an awareness of the system and trust of the government with the intention to use e-government was revealed in the findings. Social influence predicts the intention to use behaviour using the moderated variables, which are experience of the Internet and education levels. Those with greater experience and high level of education negatively moderate social influence towards the intention. In addition, effort expectancy determines the intention negatively with greater Internet experience.

Conversely, intention to use behaviour, computer self-efficacy and availability of resources are revealed to be significant predictors of the usage behaviour. E-government system usage behaviour increases as the intention behaviour, computer self-efficacy and availability of resources are also increased.

Factor analysis technique suggests combining the quality of information and quality of system factors into one group, called service quality. The study found that service quality has an insignificant relationship with usage behaviour of e-government in Saudi Arabia. Inferential statistics findings will be discussed further in the next section with the proposed hypotheses.

## A Discussion of the Hypotheses

The model that has been validated in this study is based on UTAUT, which embraces two main dependent variables that are usage of e-government behaviour and intention to use behaviour. Each dependent variable was predicted by different independent factors. The following discussion relates to the dependent variable.

### Intention to use e-government behaviour

The model of this study hypothesised that awareness of the system, social influence, effort expectancy, compatibility, performance expectancy, trust of the government and trust of the Internet influence the behavioural intentions to use e-government services. In addition, the intention to use the e-government system is influenced by demographics variables that moderate these independent factors.

### Awareness of the system

**H1:** *Behavioural intentions to adopt e-government services in Saudi Arabia are affected significantly by awareness of the system.*

An insignificant correlation between the awareness of the system and the intention behaviour to use e-government is revealed from the outcome of this research ( $\beta=.038$ ,  $p >.05$ ). The proportion of change of intention to use behaviour caused by one standard unit of the independent variable, such as awareness of the system, is indicated by the beta value. Contrary to the prediction, this finding rejects the proposed hypothesis, which could be explained by an awareness of the existence of the system alone is not a significant predictor of the intention to use the system. Shareef et al. (2011) argued that although awareness is an important factor that influences adoption, it also requires psychological and technical support to adopt the system. Van Dijk et al. (2008) suggested that one of the major governmental oversights is to believe that citizens will adopt the new system as soon it becomes available. Citizens will remain loyal to the traditional system of transactions until they discover a better option that is convenient and trusted. An awareness of the system is not a direct predictor of the adoption, but it is a critical factor before proceeding to the subsequent stage of the adoption process. The study's descriptive statistics indicates that 70 per cent of the total numbers of participants were aware of the existence of the system, whilst 30 per cent were unaware of the system. 23 per cent of participants, who were aware of the system, had not used the system before. Perception of the existence of the system does not necessary determine adoption or even the intention to use e-government, which was confirmed by this result.

**H1a:** *At the early stage of implementation, interpersonal communication is less important than mass media channels.*

The hypothesis of the study suggests that at the early stage, an awareness of the system will be more likely through mass media channels than interpersonal communication. This hypothesis was supported by the Friedman test referred to in the previous chapter, which ranked the mean scores as follows:

Variables	Mean Rank	Variables	Mean Rank
Mass media channel	2.66	Browsing the web	2.42
Government agencies	2.60	Interpersonal communication	2.32

The paired sample T-test confirmed that both mass media channels and government agencies are more important factors when learning about e-government than the factors of web browsing and interpersonal communication. A statistically significant difference between interpersonal communication and mass media channels ( $T=5.774$ ,  $P < .05$ ), and between interpersonal communication and government agencies was revealed in the test ( $T=4.083$ ,  $P < .05$ ).

At the early stage of the programme, this result can be justified for the reason that it requires a greater length of time before it can be trusted and communicated through interpersonal communication. The Saudi society culture tends to avoid uncertainty and is reluctant to adopt new ideas, as discussed earlier. This result is also consistent with the outcomes referred to in earlier literature, which revealed that early system adopters are more likely to learn about the innovation through media channels than interpersonal channels (Rogers, 1995, 2003; Dimitrova and Chen, 2006).

The importance of mass media channels, such as TV, radio or newspapers to advertise electronic services to the citizens in the current stage is emphasised in the results. In addition, government agencies should also play a vital role in promoting their online services through posters or other media promotion. Although interpersonal communication is considered as a vital factor in a highly collective society, the system currently fails to reach an acceptable level amongst the population, and usage of the system is dependent upon the beliefs of the user in preference to the advice and opinions of others.

## **System Compatibility**

**H2:** *Behavioural intentions to adopt e-government services in Saudi Arabia are affected significantly by compatibility.*

Rogers (1995, p.223) defined compatibility as “the degree to which an innovation is perceived as consistent with the existing values, past experiences, and the needs of potential adopters”. An insignificant direct correlation between compatibility and the intention to use e-government with ( $\beta=.013$ ,  $p >.05$ ) is indicated by the results of this study. The compatibility factor includes behavioural, cultural and social aspects (Shareef et al., 2011). Face-to-face interaction, which is the preference within the culture of Saudi society, could explain this result. The lack of personal interaction is explained by Gilbert et al. (2004) as creating the perception of compatibility among citizens to adopt e-government system. Other researchers comment that compatibility has an indirect relation with the adoption through performance expectancy. Chan et al. (2010, P 526) stated “If an e-government technology is highly compatible with an individual’s lifestyle, he or she can use it with minimal changes and, from a cost-benefit perspective, perceive greater performance improvement”.

Further analysis indicates that the Pearson correlation provides a moderate correlation between performance expectancy and compatibility, which stood at .408 with significant value ( $p<.05$ ). This study examined the relation of both compatibility and performance expectancy towards the intention to use e-government by using the regression test. A significant correlation between the interaction of the two factors and intention to use e-government with ( $\beta=.146$ ,  $p <.05$ ) was revealed. These results confirmed that citizens perceived the compatibility of the system as a benefit of using e-government, suggesting an indirect relation between the compatibility of the system and the intention to use e-government through the performance expectancy factor that measured the benefits of the system.

**H2a:** *Gender moderates the influence of compatibility toward the intention to use e-government behavior in Saudi Arabia.*

The findings of the study failed to support the hypothesis, because gender is not revealed as moderating the influence of compatibility towards the intention to use e-government with the F-ratio of improvement to predict the outcome and the significant value ( $F =.866$ ,  $p >.05$ ).

A further hypothesis in the study is that the segregation of gender and the driving ban for females in Saudi Arabia could foster the compatibility of using online services towards e-government adoption among females (Siddiqui, 2008).

Based upon this, the study hypothesised that allowing government transactions to be made online from home would be more compatible with the lifestyle of females in Saudi Arabia as a conservative culture. The mean score for the statement “e-government provide more chance for women to enrol with government services online” within the descriptive outcome, is 4.7 out of 5, which is relatively high. At the end of the survey, one of the female participants commented that “*although the e-government system is considered as a good opportunity for females in Saudi Arabia who are suffering from limited access to services and general segregation of gender, we still think that government transactions are men’s responsibility*”. A further explanation of this result is that the number of female participants in this research is relatively low. The descriptive statistics revealed that females account for 25 per cent of the total participants, with only 177 responses.

### **Social influence**

**H3:** *Intention to use e-government systems in Saudi Arabia is affected significantly by social influence.*

The degree to which an individual believes the importance of the opinions of others about whether he or she should use a new technology is the definition of social influence. The hypothesis that Saudi society with its culture of low cultural individualism is more likely to be influenced by family, friends and other important people in the society to adopt e-government was suggested in this study. Conversely, the study found that social influence has an insignificant effect on the intention to use e-government behaviour with ( $\beta=.003$ ,  $p >.05$ ). Previous studies in this area discovered that social influence is a direct predictor of technology adoption (Al Awadhi and Morris, 2008; Al-Shafi and Weerakkody, 2009).

However, this result agrees with George (2004), who investigated the factors that influence customers’ belief in e-commerce field and found no effect of social influence on customers’ intention to purchase through the Internet. Shih and Fang (2004) also discovered an insignificant correlation between social norm and the adoption of Internet banking.



These findings could be explained as the result of the nature of the participants, because the majority of respondents claimed that they have a high level of education and a wide range of Internet experience. Individuals with high level of education and experience of the Internet are not usually influenced by the opinions of others, as will be discussed in the following hypotheses. Respondents scored an average of 4.5 for the statement that “I would use e-government if I need to use it”.

A further explanation for the result is mentioned by Venkatesh et al. (2003), who claim that social influence has an insignificant relationship with the adoption within a voluntary environment. E-government services are not compulsory in Saudi Arabia and this could support the outcome of this study.

**H3a:** *Gender will moderate the social influence toward the intentions to use e-government service in Saudi Arabia.*

**H3b:** *Age will negatively moderate the social influence toward the intentions to use e-government service in Saudi Arabia.*

**H3c:** *Internet's experience will negatively moderate the social influence toward the intentions to use e-government service in Saudi Arabia.*

**H3d:** *Level of education will negatively moderate the social influence toward the intentions to use e-government service in Saudi Arabia.*

An insignificant direct effect of social influence upon intention behaviour was found in this study. However, the study also predicts an effect of the moderated value (age, gender, internet experience and level of education) upon the social influence towards the adoption of e-government. The study reveals an insignificant relationship when the social influence factor was moderated by gender and age with ( $P > .05$ ).

One likely explanation of this result is that the descriptive statistics of this research confirmed that 70 per cent of study participants were males, and 90 per cent of the total participants were under the age of 50. Although participants' age range represents the average age in Saudi Arabia, it fails to allow for significant differences between the groups.

The relationship between social influence and intention to use is significant and moderated by the participants' education levels and experience of the Internet. Social influence effect upon the intention to use increased as the level of education or experience of the Internet decreased. Interaction between social influence and Internet experience produced a significant correlation with the intention to use e-government with ( $F = 1.759, p < .05$ ).

In addition, the interaction between social influence and education level revealed a significant relationship with the intention to use e-government ( $F = 2.405$ ,  $p < .05$ ).

Parameter estimates reveals that social influence became a more important factor when predicting the adoption among citizens with low level of education and low experience of the Internet. This finding is compatible with similar studies (AL-Gahtani et al., 2007; Venkatesh and Zhang, 2010) that discovered a negative correlation between intention to use and social influence when it is moderated by Internet experience and education levels.

### **Performance expectancy**

**H4:** *Behavioural intentions to use e-government services in Saudi Arabia will be significantly affected by performance expectancy.*

The extent of the belief of citizens in achieving greater benefits by using the e-government system than adherence to traditional government transactions is referred to as performance expectancy. It also refers to the degree to which users believe that using e-government services will provide communication with the government in terms of saving time, money, benefits, improving the quality of government services and increasing equity between citizens. As citizens anticipate benefits from using the innovation, there is a suggestion that the intention to use electronic service will increase. The findings of this study revealed that the intention to use e-government services is significantly predicted by performance expectancy factor with ( $\beta = .273$ ,  $p < .05$ ). This result supports the previous literature on the adoption of technology that found that performance expectancy correlates positively with the adoption of technology and the adoption of e-government in particular (Venkatesh et al., 2003; Van Dijk et al., 2008; AlAwadhi and Morris, 2008; and Al-Shafi and Weerakkody, 2009). Al-Gahtani et al. (2007) discovered that performance expectancy is the main predictor of intention to use desktop computers in Saudi Arabia based on UTAUT.

The statistical outcome of this study supports the proposed hypothesis and confirms that performance expectancy is the most salient predictor that determines intention to use behaviour. This result is predictable, because e-government services offer a wide range of benefits to the citizens. In addition, benefits such as saving cost, saving time, accessibility from anywhere and convenient services encourages citizens to adopt electronic services. This study suggests publicising the advantages of using e-government services among citizens.

In addition, the incorporation of valuable functions and usefulness within electronic services should be considered by government agencies.

**H4a:** *The influence of performance expectancy upon the behavioural intentions to use e-government service in Saudi Arabia will be moderated by gender.*

This hypothesis considered that men are more likely to be influenced by benefits that lead to the intention to use e-government services. Statistical outcomes support the hypothesis and reveal that gender significantly moderates performance expectancy towards the intention to use behaviour with ( $F = 16.360, P < .05$ ). As men tend to be more task-oriented than women this result was anticipated (AlAwadhi and Morris, 2008). In addition, cultural values and the conservative nature of Saudi society might explain the outcome, as women are highly dependent upon men for their government transactions. Men are more interested in accomplishment than women, especially in Saudi Arabia, where men are more dominant in social roles. Therefore, performance expectancy that has a focus upon the accomplishment of tasks is more likely to have a greater significance for men, whereas effort expectancy has a greater significance for women (Venkatesh et al., 2003).

### **Effort expectancy**

**H5:** *The intention to use e-government services in Saudi Arabia will be significantly affected by effort expectancy.*

Effort expectancy is defined by Venkatesh et al. (2003) as the use of the system associated with the level of ease, so that intention to use e-government services depends on individual behaviour, and if citizens believe that the system could be used easily, then their intention to use these services is increased. The findings from this research contradicts the findings of Venkatesh et al. (2003) as a direct relation between intention to use e-government and effort expectancy was revealed to be insignificant ( $\beta = .028, p > .05$ ). However, when considering the field of technology adoption, effort expectancy was revealed to have an insignificant effect towards intention to use the systems, which is supported in previous findings (Al-Gahtani et al., 2007; Venkatesh et al., 2003). In another study of e-government and citizens' adoption of these services, effort expectancy, although in this case was defined as perceived ease of use, was not found to have a direct effect on intentions to adopt e-government services (Carter and Blenger, 2004).

Davis (1989) challenged previous findings that ease of use was a direct determinant of usage, and could be an antecedent of usefulness, instead of a parallel, and this study correlated variables and found a moderate Pearson correlation between effort expectancy

and performance expectancy reaching .276 with significant value ( $p < .05$ ). As Saudi Arabia remains at the earliest stages of implementing e-government services, where simple transactions do not require significant effort, such as sending enquiries, checking information and downloading forms, and this could provide an explanation for these current findings. The work of Saudi government ministries were assessed in a study by Al-Nuaim (2011), and these findings revealed that 41% of government ministries did not implement the central features of an e-government website. In addition, 6 ministries had no online services, 13.6% had one-way interaction or second stage, and 45.4% had web presence and were either partially or completely at the first stage. Therefore, when e-government systems reach an advanced level of complexity, effort expectancy could have a greater impact on intention to use these services.

**H5a:** *The influence of effort expectancy towards the intention to use e-government services in Saudi Arabia will be moderated by gender.*

**H5b:** *The influence of effort expectancy towards the intention to use e-government services in Saudi Arabia will be negatively moderated by internet experience.*

This study has presented a hypothesis that gender will moderate effort expectancy influences for intentions to use e-government in Saudi Arabia, as there is a greater inclination for women to be influenced by ease of use rather than men. This hypothesis is supported by the findings from this study that indicate that gender is an important factor for the prediction of effort expectancy influence for intentions to use e-government with ( $F=1.298, p < .05$ ).

Another hypothesis for this study suggested that for e-government users with higher levels of Internet experience, effort expectancy was a less important factor in predicting e-government use, and is support by the statistical findings showing ( $F=1.635 =19.002, p < .05$ ). These findings are supported by the findings of Venkatesh and Zhang (2010), who argued that effort expectancy influences on intention behaviour was variable across Internet experience and gender factors, so that they suggested that effort expectancy influences were stronger for inexperienced Internet users and for women. In another study of behavioural intentions in Saudi Arabia, Al-Gahtani et al. (2007) suggested that predicting behavioural intentions based on ease of use becomes less important when users have more Internet experience.

## Internet Trust

**H6:** *Intention to use e-government services in Saudi Arabia will be significantly influenced by trust in the Internet.*

Citizens' belief that the Internet can perform secure transactions safely and that it is a dependable medium that will define Internet trust, and the hypothesis presented in this study suggests that citizens' trust of the Internet should positively affect their intentions to use e-government services. The statistical findings of this study support this hypothesis, so that intention to use e-government can be significantly predicted when the Internet is trusted with ( $\beta=.108$ ,  $p < .05$ ). Previous studies support these findings, and suggest that intentions to use e-government systems is strongly determined by Internet trust (Belanger and Carter, 2008; Carter and Belanger, 2005). Saudi Arabia has a high cultural value of uncertainty avoidance, which could justify these findings (Hofstede, 2001). In this study, trust was measured in terms of government transactions by factors of being a dependable medium, security and perceptions of safety, which could influence Saudi's intentions to use e-government systems. Previous studies have suggest that uncertainty linked to Internet shopping could be reduced in Arab countries that have high uncertainty cultures if more attention was given to measures that would reduced this uncertainty, so that e-commerce could be implemented more successfully (El Said and Galal-Edeen, 2009). In a later study into e-services adoption influencing factors in Saudi Arabia, Al-Ghaith et al. (2010) suggested that a critical factor in determining adoption is privacy.

**H6a:** *Experience of the internet will moderate the influence of trust towards the intention to use e-government services in Saudi Arabia.*

This hypothesis suggested that greater experience of using the Internet contributes to increasing trust in the Internet, so that their intention to use e-government systems is more likely, and these findings have supported this hypothesis and show that experience moderates Internet trust that encourages intention to use these services. The statistical results show that the relationship of Internet experience and trust of the Internet has a strong influence on intention to use e-government (dependent variable) with F-ratio equal to 5.292 and significant value equal 0.000( $p < .05$ ). Other findings suggest that when there was decreased Internet experience, the risk concerns regarding technology adoption increased (George, 2002). Explanations for these findings could be due to hesitation or reluctance of individuals to use e-government systems being reduced when their confidence in using the Internet and experience of using the Internet increases.

## **Government Trust**

**H7:** *Intention to use e-government services in Saudi Arabia will be significantly influenced by trust of the Government.*

Trust of the government agencies or trust of the organizations refers to the belief of the capability of the agencies and ability of the staff to implement online services in private manner, and this hypothesis suggests that citizens' trust of government agencies will significantly affect their intention to use e-government services. The statistical findings have shown that this hypothesis is not supported ( $\beta=.018$ ,  $P > .05$ ). However, these results are supported by the findings of another study that used the Web trust model and DOI and TAM theories to investigate US citizens' adoption of e-government services, and reported that there was no direct influence on intention to use e-government services by trust in the state government. However, another study suggested that trust in government agencies could be disregarded, as citizens must complete government transactions anyway (Carter and Blenger, 2004). These findings could also be explained by the moderated correlation between factors, so that government trust could be an antecedent of Internet trust factors, which are revealed by the Pearson correlation between trust of the Internet and trust of the government for .509 with significant value ( $p < .05$ ).

## **E-government behaviour and usage**

E-government behaviour and usage was another hypothesis that suggested that this could be predicted by variables of availability of resources and services, computer self-efficacy and behaviour intention.

## **Behavioural intention**

**H8:** *Behavioural intention will significantly influence usage behaviour.*

Predictions of future use of e-government systems and personal plans were factors considered in measuring behavioural intentions, because previous studies have suggested that usage behaviour of technology is a strong predictor of intention behaviour (Venkatesh et al., 2003; Ajzen, 1991). The results of the statistical analysis have supported this hypothesis with ( $\beta=.505$ ,  $p < .05$ ). Respondents' intention to use the systems defines usage behaviour of the system, which is confirmed by the high significance value of beta. Previous studies in fields of psychology and technology support these findings, so that human attitudes and actions to use the systems influence intention belief that is confirmed by TPB and TRA (Fishbein & Ajzen, 1975).

## Computer self efficacy

**H9:** *A significant influence on e-government usage behaviour will be predicted by computer self-efficacy.*

Citizens' ability to use innovation and their judgement or belief about their own capabilities define computer self-efficacy for this study, but the focus here is on skills needed to carry out e-government transactions, as well as their confidence and knowledge.

This study has presented a hypothesis that usage behaviour of e-government systems could be significantly determined by computer self-efficacy belief, and the statistical analysis of data supported this hypothesis that revealed ( $\beta=.333$ ,  $p < .05$ ). After intention to use behaviour, the second strongest predictor of usage was computer self-efficacy, which is supported in previous studies relating to e-government systems adoption (Huang et al., 2006; Wangpipatwong et al., 2008; Chan et al., 2010). Compeau and Higgins (1995) suggested three dimensions to measure self-efficacy that in the context of computer usage were generalizability, strength and magnitude. Therefore, individuals with high self-efficacy generalizability are confident in conducting various tasks, and individuals with high self-efficacy are more confident in carrying out difficult tasks. In contrast, when individuals' levels of self-efficacy are low, then they are more likely to be frustrated by obstacles they encounter. In Saudi Arabia, these findings could be explained, as e-government systems are relatively new, so that ability and confidence to use computers are the probable factors that citizens used to judge their own capabilities.

**H9a:** *The influence of computer-self efficacy toward e-government adoption in Saudi Arabia will be moderated by internet's experience.*

This study presented a hypothesis that suggests that individuals' adoption of e-government systems and usage behaviour will be influenced by their experience of using the Internet, and the statistical analysis supports this hypothesis with Internet experience and computer self-efficacy factors revealing they significantly influence usage behaviour (dependent variable) with F-ratio equal to 6.792 and significant value equal 0.000( $p < .05$ ). There is a logical explanation of this result, because as citizens' technology experience increases, they become more confident about their skills and knowledge, which also increase. Therefore, when individuals believe they are able to perform tasks, their attitudes towards performing the tasks will also improve.

## **Resources availability**

**H10:** *E-government adoption will be significantly influenced by the availability of resources.*

Citizens' technical resources they require to carry out e-government transactions define resources availability for this study, and reasonable Internet connection and ownership of a personal computer are factors that have been adopted to measure this influence. Therefore, this hypothesis predicts that e-government adoption is fundamentally determined by availability of resources, and is supported by the statistical analysis of data revealing that availability of resource significantly influences usage behaviour of e-government ( $\beta=.138$ ,  $p <.05$ ). In addition, awareness of the system significantly determines the influence of availability of resources ( $\beta=.471$ ,  $p <.05$ ). Therefore, when resources are available to citizens, then their awareness of e-government services increases, and with sufficient resources, usage attitudes increase to enable them to carry out e-government services. Previous studies support these findings by suggesting that infrastructure for technology is needed to support individuals adopting innovation and removing barriers to technology that are basic (Venkatesh et al., 2003; Van Dijk et al., 2008; Shareef et al., 2011). In developing countries the digital divide is often more significant, so that a critical factor that influences the adoption of e-government services is likely to be availability of resources (Shareef et al., 2011), and this study also concluded that citizens' attitudes to using e-government systems are strongly influenced if they believe that relevant resources are available. In another study, the findings suggested that technological, social, cultural and economic factors are likely to influence availability of resources; therefore, if a society is unfamiliar with modern technology, lacks skills that are fundamental to using technology or are economically poor, then resources will be lacking (Van Dijk et al., 2008).

In contrast, another study by Venkatesh et al. (2003) argued that if effort expectancy and performance expectancy were presented in the same module, then availability of resources as a factor towards intention behaviour becomes an insignificant variable.

## **Service Quality**

**H11:** *E-government usage behaviour will be significantly influenced by the quality of information presented.*

**H12:** *E-government usage behaviour is influenced significantly by system quality.*



According to Shareef et al. (2011), for citizens to gain information about intended objectives, then the information provided within the website needs to be timely, up-to-date, understandable, organised, accurate and complete to determine the coverage of information quality.

In a study of e-government services in the UK, Gilbert et al. (2004) found that an important predictor of e-government adoption was information quality. This current study presents a hypothesis that high quality information within e-government services will positively influence citizens' adoption of these services. To measure the variable of information quality, information that was relevant, complete and up-to-date by government agencies for citizens was analysed.

Factors of shutdown problems and assured recovery speed, regular maintenance of systems, accessibility to other resources, integrated services and availability of customer services were examined to measure system quality. Other studies have suggested that e-government adoption is influenced by system quality due to the contribution of faceless interaction of e-government services (Wang, 2003; Kumar et al., 2007; Shareef et al., 2009). Therefore, this hypothesis suggests that system quality can be determined significantly based on usage behaviour of e-government systems.

Factors of service quality and information quality were loaded as one component for factor analysis output, so that usage behaviour used two elements as one factor for the hypothesis to determine service quality. Therefore, the previous hypotheses were revised based on statistical results as:

**H11:** *Usage behaviour for e-government will be significantly influenced by service quality.*

Previous studies have revealed that adopting e-government systems is affected by citizens' satisfaction, which is strongly influenced by high quality service (Gilbert et al., 2004; Kumar et al., 2007). In another study of e-services usage and adoption in Saudi Arabia, Al-Ghaith et al. (2010) found that adoption is strongly determined by service quality, which was defined as a critical factor.

The findings from the statistical analysis of this current study have revealed that between usage behaviour and service quality of e-government there is an insignificant relation ( $\beta = -.005$ ,  $P > .05$ ). These results are supported by the findings of Shareef et al. (2011), who studied e-government adoption at the static stage and found an insignificant relation

between adoption and information quality. In contrast, another study suggested that for e-government adoption, information quality has an indirect relation due to its influence on perceived ease of use of the service and perceived usefulness. Therefore, this negative result indicates that e-government websites are providing Saudi citizens with service quality that is poor. However, as Saudi Arabia is at an initial stage of e-government implementation that does not need services of high quality, this could explain the insignificant relation for these findings, but at an advanced stage of implementation, then service quality in Saudi Arabia could be a more significant predictor of adoption, when services become more complicated.

The proposed hypotheses are summarised in Table 7.1 below:

HN	Proposed Hypotheses	Result
<b>H1</b>	<i>Behavioural intentions to adopt e-government services in Saudi Arabia are affected significantly by awareness of the system.</i>	Not Supported
<b>H1a</b>	<i>At the early stage of implementation, interpersonal communication is less important than mass media channels to learn about e-government.</i>	Supported
<b>H2</b>	<i>Behavioural intentions to adopt e-government services in Saudi Arabia are affected significantly by compatibility.</i>	Not Supported
<b>H2a</b>	<i>Gender moderates the influence of compatibility toward the intention to use e-government behavior in Saudi Arabia.</i>	Not Supported
<b>H3</b>	<i>Intention to use e-government systems in Saudi Arabia is affected significantly by social influence.</i>	Not Supported
<b>H3a</b>	<i>Gender will moderate the social influence toward the intentions to use e-government service in Saudi Arabia.</i>	Not Supported
<b>H3b</b>	<i>Age will negatively moderate the social influence toward the intentions to use e-government service in Saudi Arabia.</i>	Not Supported
<b>H3c</b>	<i>Experience will negatively moderate the social influence toward the intentions to use e-government service in Saudi Arabia.</i>	Supported
<b>H3d</b>	<i>Level of education will negatively moderate the social influence toward the intentions to use e-government service in Saudi Arabia.</i>	Supported
<b>H4</b>	<i>Behavioural intentions to use e-government services in Saudi Arabia will be significantly affected by performance expectancy.</i>	Supported
<b>H4a</b>	<i>The influence of performance expectancy upon the behavioural intentions to use e-government service in Saudi Arabia will be moderated by gender.</i>	Supported
<b>H5</b>	<i>The intention to use e-government services in Saudi Arabia will be significantly affected by effort expectancy.</i>	Not Supported
<b>H5a</b>	<i>The influence of effort expectancy towards the intention to use e-government services in Saudi Arabia will be moderated by gender.</i>	Supported
<b>H5b</b>	<i>The influence of effort expectancy towards the intention to use e-government services in Saudi Arabia will be negatively moderated by internet experience.</i>	Supported
<b>H6</b>	<i>Intention to use e-government services in Saudi Arabia will be significantly influenced by trust in the Internet</i>	Supported

<b>H6a</b>	<i>Experience of the internet will moderate the influence of trust towards the intention to use e-government services in Saudi Arabia.</i>	Supported
<b>H7</b>	<i>Intention to use e-government services in Saudi Arabia will be significantly influenced by trust of the Government.</i>	Not Supported
<b>H8</b>	<i>Behavioural intention will significantly influence usage behaviour.</i>	Supported
<b>H9</b>	<i>A significant influence on e-government usage behaviour will be predicted by computer self-efficacy.</i>	Supported
<b>H9a</b>	<i>The influence of computer-self efficacy toward e-government adoption in Saudi Arabia will be moderated by internet's experience.</i>	Supported
<b>H10</b>	<i>E-government adoption will be significantly influenced by the availability of resources.</i>	Supported
<b>H11</b>	<i>Usage behaviour for e-government will be significantly influenced by service quality.</i>	Not Supported

**Table 7.1: Summary of hypotheses results.**

### Research Adoption Model

This study has examined adoption of e-government systems in Saudi Arabia by its citizens by developing and validating an integrated model based on UTAUT with some added variables that made it more suitable for the cultural values of Saudi Arabia. This research also adopted the Cronbach alpha test to measure internal reliability, and the Cronbach alpha value was over 0.872 that shows a high internal reliability coefficient. Therefore, the construct validity of the data was confirmed by the factor analysis by using the correlation matrix between variables and factor loading.

Intention to use e-government was the first dependent variable that was correlated with trust of the Internet, trust of the government, awareness of the system, social influence, compatibility, effort expectancy and performance expectancy. Independent variables revealed an outcome that around 25% of intention to use e-government (dependent variable) with R-square equal to 0.251, and this significantly contributes to the results.

These results also show that intention to use e-government systems is strongly predicted by performance expectancy, and confirms that users give greater consideration of benefit factors over other factors. The second most important predictor of e-government adoption by citizens was shown to be trust of the Internet, which can be explained by the high uncertainty avoidance value of Saudi culture. People hesitation or reluctant to adopt electronics government services are reduced with their greater experience of the internet as their confidence of the internet's usage increased. The findings of Carter and Weerakkody (2008) support these findings, as they argue that the most significant variables influencing the adoption of e-government in the UK and the USA are relative advantage and trust.

When moderated by individuals' experience of the Internet, this current study found a significant correlation between intention to use and effort expectancy, and that intention behaviour was predicted by social influence when moderated by individual education levels and Internet experience. Also, for intention behaviour through performance expectancy variable, compatibility variable has an indirect significant relation. However, the influence of the moderated variables directly such as the internet's experience to the intention or usage behaviour could modify the affect of the main independent variables towards the intention to use or the usage's behaviour.

In contrast, usage behaviour (second dependent variable) was hypothesised to correlate with service quality, computer self-efficacy, resource availability and intention to use as independent variables. This study performed multiple regression tests and found that independent variables or the model explained around 34% of the variance within the dependent variable with R-square equal to 0.343, which contributes significantly to these results.

These findings suggest that usage behaviour can predict intention to use as a variable that has the highest significance, and the second predictor of usage behaviour was shown to be computer self-efficacy that was followed by the factor of resources as the third predictor. The availability of resource factor was measured in this study considered not only the availability of the resource but expand to include adequate resources such as high speed internet and adequate computer technology at home. Previous research supports these results within the field of technology adoption (Al-Gahtani et al., 2007; Venkatesh et al., 2003). After removing insignificant factors related to moderated variables, Figure 7.1 illustrates important predictors of e-government adoption in Saudi Arabia.

When attempting to determine e-government adoption, the factors of service quality, trust of government and awareness of the system were removed from the conceptual model as these were considered to be insignificant determinants. Also, the age variable that could influence adoption was removed from the model as a moderate variable, as the findings showed that relation of independent factors towards adoption is not moderated by age. Therefore, when the age of adopters change, there is no difference in influence of e-government adoption, and could be explained by the significantly large population of young people in Saudi Arabia that would reflect little difference in age. Also, most respondents to this survey who were Internet users were young people, which do not reflect the impact of age differences.

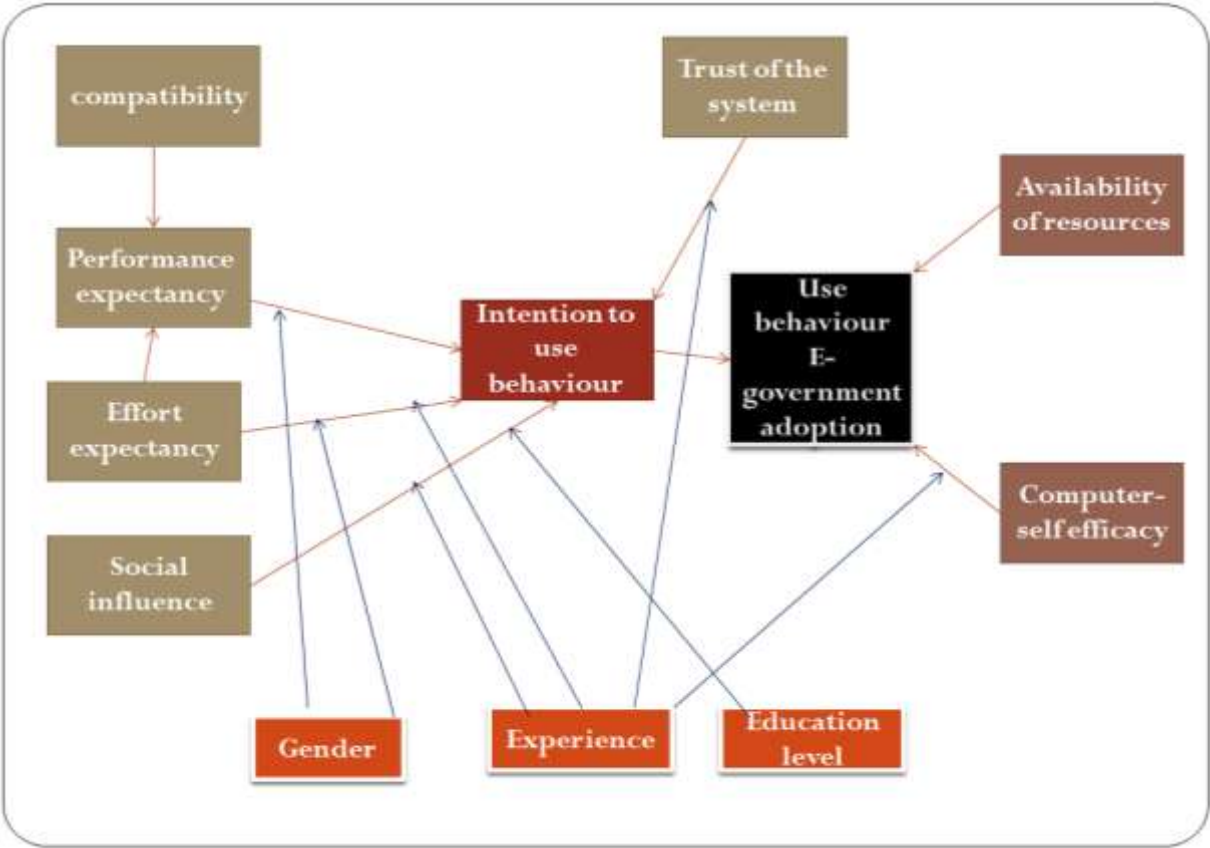


Figure 7.1: Research Adoption Model

## Conclusion

The findings of the research have been discussed in this chapter that have included data analyses outcomes, cultural values of Saudi Arabia and the theoretical background, and has attempted to present the critical factors that could influence the adoption of e-government in Saudi Arabia by using a revised model of e-government adoption.

Descriptive findings were presented at the beginning of the chapter to help explain reasons for the statistical analysis outcomes, which when proceeded to examine the hypotheses to determine if they could be supported or rejected when moderated by cultural values.

Performance expectancy was revealed to be the most influential predictor of intention to use e-government in Saudi Arabia, and that males are more likely to be influenced by benefits that could be gained from the systems, which encourages adoption behaviour. Trust of the Internet was also confirmed as a significant factor that determines intention behaviour, and that the relation between trust and intention is negatively moderated by experience of the Internet.

In addition, no direct relation was revealed between intention behaviour and social influence, compatibility or effort expectancy, and intention to use e-government through performance expectancy is affected by compatibility. Also, the relation between effort expectancy and intention behaviour is moderated by Internet experience, and the correlation between intention to use e-government and social influence in Saudi Arabia was shown to be moderated negatively by Internet experience and level of education.

On the other hand, predictors of usage of e-government behaviour have been shown by these findings to be availability of resources, computer self-efficacy and intention behaviour. Also, citizens with greater experience of the Internet were shown to be strongly influenced towards adoption of e-government systems and usage behaviour by enhanced computer self-efficacy.

In contrary to the hypotheses presented in this study, the findings have revealed that service quality, trust of government and awareness of the system had little influence over adoption of e-government in Saudi Arabia, as it remains at the initial stage of implementation.

Finally, this chapter presented an integrated model for citizens' adoption of e-government systems in Saudi Arabia through development and validation. In the next chapter, the researcher will attempt to synthesise the responses to the research questions, after discussing the findings in this chapter. The next chapter will also attempt to explain how this research has contributed to the gap in knowledge, and its implications for further research and practice. Limitations will also be considered in the next chapter, as well as recommendations for future research directions.

# Chapter 8: Conclusion

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## **Introduction**

The findings of the research were discussed in the previous chapter, and this chapter seeks to provide a conclusion of earlier discussions and synthesis the main findings of the thesis. This chapter will present an overview of the research, together with the main findings of the research. It will highlight the answers to the research questions, as well as discussing the key features of the thesis. The implications for theory and practice identified in the research findings will also be considered. Finally, the limitations of the study will be addressed, together with the identification of the direction of future research into the area of e-government implementation and adoption.

## **An Overview of the Research**

Many governments have sought to rapidly implement e-government systems, and transform their traditional paper-based systems into electronic transactions during the current global information era. Such a transformation in processes is both reasonable and logical given the numbers of benefits that could be achieved by implementing a programme of e-government.

Many benefits to government, the business sector, as well as citizens have been identified in the literature. Carter and Belanger (2005) comment that a system of e-government enhances the efficiency and effectiveness of government services. In addition, e-government services enhanced service quality with cost reductions and improved accessibility. The overall aim of systems of e-government is the reduction of corruption and intimidation, as well as making government processes more efficient (Gupta and Jana, 2003; Moon, 2002).

The implementation of e-government is challenging, and governments face political, organisational, social, as well as technical challenges; all of which hinder the process of implementation. Heeks (2006) claims that there has been a failure rate of 35% of e-government projects in developing countries, with half of these projects partly failed, and only 15% that could be considered as successful. Within the literature, there has been a

greater focus upon supply factors, which includes the political, organisational and technical aspects. However, the literature neglects the demand side of such implementation, which includes human, social and cultural factors. It is claimed by Al-Shafi and Weerakkody (2010) that e-government adoption is greatly affected by the perspectives of citizens, and their behaviour influences the adoption of e-government.

Within developing countries, the adoption of e-government services is considered to be critical in order to provide social and economic benefits for citizens. There is a general perception that most technologies are designed and developed in developed countries, which are culturally-biased in favour of social and cultural systems within those countries (Hill et al., 1998). "Adoption decisions are highly subjective to the attitudes of the people in an organisation/country and, they may consequently be influenced by the organisation/country's social and cultural characteristics" (Erumban and Jong, 2006; p. 3). As a result, systems of e-government cannot be simply purchased and adopted as an off-the-shelf package, yet there is no model to ensure the successful adoption of e-government (Al-Shehry et al., 2006).

There is a lack of knowledge in government agencies about the adoption of e-government services, together with identified critical factors that could influence its successful adoption by citizens. This study therefore examines user factors that have an influence upon e-government adoption, and particularly the cultural influence that may limit adoption in developing countries. It proposes a conceptual model that considers relevant socio-cultural constructs. Although the adoption of e-government has been widely studied from both technical and management perspectives, there is a need for further research to examine the human factors involved, and particularly the psychological, cultural and social factors affecting users in developing countries. The researcher considers these factors to be particularly relevant, because social and cultural issues may affect the lives of citizens in developing countries to a greater extent than those in developed countries.

Expectations for the adoption levels in Saudi Arabia have not been fulfilled. The United Nations Department of Economic and Social Affairs (UNDESA) conducted systematic global surveys in order to measure e-government development through an evaluation of various e-government services, including infrastructure, human resource and e-participation. Saudi Arabia revealed rapid development in global ranking from 80<sup>th</sup> position in 2005, 70<sup>th</sup> in 2008, 58<sup>th</sup> in 2010 and 41<sup>st</sup> in 2012.



However, although the index for Saudi Arabia is above the global average for e-services, human resources, infrastructure, it is below average in e-participation (UN, 2012).

Yesser, which is the name for the Saudi e-government programme, conducted customer preparedness survey to measure the use of e-government services. The results revealed a high level of awareness of the programme at 82%, with a high score for trust that reached 92%. However, both usage and satisfaction stood at low levels with scores of 58% and 55% respectively (Yesser, 2011). As a result, this study examined the issue of the low rate of e-government adoption by citizens in developing Arab countries, with a predominant focus upon the Kingdom of Saudi Arabia. Despite the essential influence of the supply side of the implementation such as website design and system reliability on the adoption of e-government, this study focuses on the factors that influence the demand side of the implementation which are the citizens. It is important that this new innovation is tailored to the requirement of citizens, by taking into account the religious, cultural, traditional and other beliefs variables in order to ensure its widespread dissemination and adoption.

The research background and outline of the motivation for conducting this study are considered in Chapter 1. Existing literature has identified factors that influence citizens' adoption of e-government services in developing countries (Al-Shafi and Weerakkody, 2010; Alawadhi and Morris, 2008). However, the influence of Arabic culture towards the adoption of e-government by citizens is insufficiently considered. Consequently, this research sought to address this deficiency by investigating the effect of Saudi culture upon the adoption of e-government, and proposes a conceptual model that includes relevant constructs. The main objective of the research is identifying factors affecting e-government adoption from the perspective of citizens as the demand side, by investigating the social, psychological and technical factors, which are moderated by cultural values that influence the adoption of e-government. The problem of low adoption rate, the identified research objective and significance of the research are discussed in Chapter 1.

A systematic review of the literature was performed in order to consider the relative factors affecting the adoption of e-government, and to build a comprehensive, associated and non-biased literature base. The extensive literature review was presented in three chapters as follows:

Chapter 2 considered the general background of e-government beginning with the emergence of the technology, a comparison with e-commerce, and examination of different definitions of e-government from various perspectives. Various categorisations of e-government revealed in the literature concerning beneficial parties G2G, G2B and G2C are presented in this chapter. The various stages of e-government and levels of progression are considered, from pre-planning to advanced stages (presence, interaction, transaction and transformation stages). This is followed by a discussion of the challenges and benefits that follow the implementation and the adoption of e-government.

The characteristics of Saudi Arabia, together with an evaluation of the current situation and progression of the development of the e-government programme are discussed in Chapter 3. This chapter also investigated the technical, political, organisational and social factors that affect the programme's implementation within Saudi Arabia. Chapter 3 also identified those factors that hinder or motivate the adoption of e-government in Saudi Arabia. In addition, cultural characteristics of Saudi society that could moderate the adoption process are considered in the process of developing research hypotheses.

Chapter 4 considered recommendations in the literature in developing a theoretical and conceptual base for studying this new area of research, and especially at the early stage. This chapter considered the theoretical background and the conceptual research paradigm in order to develop a firm theoretical base for the development of a conceptual model that includes salient factors influencing the adoption of e-government. E-government is a new field of study that suffers from a lack of theoretical concepts. As a result, this study presented relevant models and theories from various fields, such as psychology, social and technology, which are applied to e-government in order to obtain the catalyst variables affecting e-government adoption from the citizens' point of view.

The chapter made use of the theory of planned behaviour (TPB), theory of reasoned action (TRA), technology acceptance method (TAM), diffusion of innovation theory (DOI), Unified Theory of Acceptance and Use of Technology model (UTAUT) and the trust model. Previous literature is reviewed that uses the theoretical background to identify the key factors that influence the adoption of e-government. The influence of the cultural values on the technology adoption is discussed in this chapter, which highlights the socio-cultural dimension of Arab nations. The UTAUT model is justified as being the most suitable model for studying the adoption of e-government adoption, together with an amended version that is used to validate the model for Saudi Arabia.

Finally, the hypotheses were developed with consideration of the country's socio-cultural values, together with the proposed conceptual model. The proposed model of e-government makes the assumption that system awareness, performance expectancy, compatibility, effort expectancy, trust of the Internet, social influence and trust of government influence behavioural intention to adopt e-government services. This study also makes the assumption that availability of resources, computer self-efficacy, system quality, information quality and behavioural intention will explain usage behaviour in adopting e-government services. Demographic variables moderating the influence of previous factors towards the adoption of e-government are also hypothesised in this study.

Chapter 5 considered research methods that are most consistent with the philosophy of the research, and able to address the research questions and validate the research model. An online quantitative questionnaire was designed for the case study to survey citizens from heterogeneous groups within a diverse area of Saudi Arabia that could be representative of Arab developing countries. A philosophy of positivism was utilised in this study, and used a deductive approach and survey strategy for conducting the research and for collecting data. The quantitative method is preferred in this study because of the need for objective judgment and result consistency, which could be generalised for larger populations (Bryman, 2008).

Chapter 6 presented an analysis of the results that collected from the survey questionnaires that were conducted in Saudi Arabia. This analysis determined the factors that have an impact upon the adoption of e-government in Saudi Arabia. The findings of the survey and an analysis of the data are given in this chapter by using both a simple description, as well as an advanced statistical methodology. A preliminary analysis is presented in order to check the accuracy of the data, followed by an examination of data reliability and validity. There were 692 completed and adequate responses, with female participants accounting for approximately 25% of total participants, whilst males accounted for 75% of the total number of participants. A descriptive analysis gave the result frequency and percentages in table form, and inferential statistics were used to examine the correlation between the variables by using factor analysis and a regression test. A high internal reliability was confirmed, indicating an overall Cronbach Alpha Value of more than 0.872. Data validity was investigated and confirmed through the use of factor analysis. Factor analysis validated the original proposed model by extracting six factors that hypothesised intention to use behaviour and three factors affecting usage behaviour.

Chapter 7 used in-depth discussion to interpret the key finding of the factors that influence citizens' adoption of e-government in Saudi Arabia. The findings from current research are synthesised with earlier literature to interpret the outcome of the proposed hypotheses. Finally, this chapter reconsiders the conceptual model discussed in Chapter 4 and revalidates the model according to the findings of the research.

## **Research Findings**

The main findings are derived from the systematic literature review, the empirical research and answers to the research questions are summarised as follow:

- A number of organisational, political, technical and social issues that have influenced the implementation of e-government system are identified in Chapter 2. Key factors that hinder or promote the implementation of e-government in Saudi Arabia are examined in Chapter 3. Factors, such as top management support, clear vision, a young and educated population, a large land area, the importance of the country as a place of pilgrimage for Muslims, high temperature and a strong economy that could motivate the implementation of e-government were all confirmed within the literature. However, the literature also revealed factors within the country that might impede progress. These include technical factors, such as lack of a unified infrastructure, re-engineering processes; organisational factors, such as judiciary requirements, inadequate e-services regulations, lack of partnership and cooperation; social factors, such as lack of trust, insufficient awareness of e-government and insufficient user IT skills. The first question of the study, 'What is the research evidence relating to the factors that promote and constrain e-government implementation?' is answered in Chapter 2 and 3.
- This study aims to develop a conceptual model that embraces the catalyst constructs affecting citizens' adoption of e-government in Saudi Arabia. Theories from various fields were investigated and developed in the study, resulting in an amended version of UTAUT that would determine the factors affecting the adoption of e-government from the citizens' perspective as the most appropriate model. The theoretical background of the research is examined in Chapter 4, which answers the second research question 'Which theoretical model is the most suitable for the analysis of e-government adoption by citizens specifically for Saudi Arabia?'

- Online non-probability sampling methods and unrestricted self-selected surveys by posting the survey online in various public social networks were used in this study. The research method is designed and answered in Chapter 5.
- Descriptive research finding revealed that about 70 % of participants were aware of the e-government programme, whilst 30 % were unaware of the concept. The empirical research revealed that participants find that mass media channels and the government agencies are more important factors in learning about e-government than browsing the Internet and interpersonal communication. Research findings revealed that 77 % of participants have used the e-government system, and only 23 % had not used the system before.
- Inferential statistics revealed that trust of the Internet and trust of the government constructs were loaded perfectly in separated groups, whilst information quality and system quality were grouped together and called 'service quality' using the factor analysis.
- The regression test proved that two types of constructs, performance expectancy and trust of the Internet, had a significant impact upon the behavioural intentions of citizens when adopting e-government. There is an indirect relationship between the compatibility factor and the intention to use e-government through performance expectancy. Social influence predicts the intention to use behaviour using the moderated variables, which are education levels and experience of the Internet. Those with a higher level of education and more experience negatively moderate social influences towards the intention. Effort expectancy negatively determines the intention with greater experience of the Internet. The outcome revealed that independent variables explain about 25% of the dependent variable (intention to use e-government).
- Regression analysis revealed that intention to use behaviour, computer self-efficacy and availability of resources were significant predictors of usage behaviour, and these independent variables explain about 34% of the variance within the dependent variable (usage behaviour).

- There was no correlation revealed between the measures of awareness of the system with the intention to use e-government. Awareness of the system is considered to be a crucial factor when adopting technology; this study shows that awareness needs other technical and psychological support in order to determine e-government adoption. Moreover, trust of the government was not a strong predictor of the intention to use e-government. The study also found that trust of the government correlates highly with the trust of the Internet construct, which is considered as an antecedent of this factor. In addition, service quality has no relation with usage behaviour, which is justified by the early stages of implementation that is uncomplicated. Age variables were eliminated from the model, because a moderated variable influences the adoption. This study discovered that age does not moderate the relationship of independent factors towards adoption.
- It was found that the cultural characteristics of the country have an impact on the result, which reflects the few female participants due to the conservative society and lack of interest in the subject for females, as many are fully dependent upon their male relatives when dealing with government transactions. However, males account for 74% of those who have never used the system before, which is explained by gender separation and the driving ban that motivate females to conduct e-government transactions from home. The significant correlation between trust and the intention to use was anticipated, since Saudi culture demonstrates uncertainty avoidance values (with face to face preferences). Furthermore, the significant correlation between performance expectancy and the intention to use was expected, since the lack of sense of time cultural value is presented, which could be overcome by using the flexible e-government system. The youth population of the country negates the influence of age as a moderated variable. Tribal systems, religious adherence and collectivism influence the culture of the Saudi people, which often makes them reluctant to change their ideas. However, e-government may be compatible if cultural issues are considered when promoting the adoption of e-government.

The main objective of the research is to determine the factors that affect the adoption of e-government from the citizens' perspective by investigating the psychological, technical and social factors that are moderated by cultural values, thus influencing the adoption of e-government by citizens. The previous findings discussed in Chapters 6 and 7 answered the

third research question, which is ‘What are the factors that could affect the adoption of e-government in Saudi Arabia by its citizens in significant manner?’

This main research question was subdivided into 4 further questions, as follows:

- What are the key factors affecting the usage behaviour of e-government?
- What are the key factors affecting the intention to use e-government?
- How is the adoption of e-government by Saudi citizens influenced by demographic variables?
- How is the adoption of e-government by citizens in Saudi Arabia influenced by national culture?

The cultural characteristics of the country were investigated in order to support the researcher to identify the factors that influence the adoption of e-government in Saudi Arabia. The cultural dimension of low individuality and high collectivism was demonstrated on the social influence factor while Trust was included as a variable for this study of Saudi Arabia, because it has high scores for uncertainty avoidance and face-to-face interaction preference cultural values. In addition, adoption of e-government services would be encouraged by the conservative society, gender segregation and the hot climate of Saudi Arabia, but citizens are likely to continue to prefer face-to-face interaction as a cultural preference that cannot be possible with e-government services. Therefore, a compatibility variable was added to UTAUT to identify a personal attitude factor. Culture characteristics of polychronic and lack of sense of time was reflected on the performance expectancy factor. As e-government services are available online at all times and from any location, this flexibility could be supported by this cultural characteristic to adopt this new technology, as users do not need to use it at specific times. High power distance (pyramidal class) is reflected in digital divides problem and facilitating condition factor. In high power distance societies, information is controlled, few people have access to resources, and different groups have different involvement levels in the society (Khalil, 2011).

## **Contribution of the Research**

The examination of citizens’ characteristics and socio-cultural influences affecting the adoption decision has enhanced the researcher’s understanding of how technology can assist the adoption of e-government, and there are four main contributions arising from this study.

Firstly, the process of e-government adoption in developing Arab countries was considered, and emphasised the need to focus upon the perspectives of citizens (G2C) that were neglected in previous literature. Secondly, the study places an emphasis upon national and cultural dimensions that moderate social, technical and individual characteristics affecting citizens' adoption of e-government.

It is anticipated that the findings of this research will support policy makers and governments when tailoring e-government services to the requirements and choices of citizens, reflecting users' personal characteristics and encouraging high levels of adoption, which are more likely to lead to successful programme implementation. Thirdly, this study has validated technical, social and psychological theories in the new field of e-government, and within a country that has diverse cultural values, such as Saudi Arabia. Finally, the study is expected to add value to existing literature by utilising the model to determine the adoption of e-government in developing countries that have a wide variety of cultural factors to consider. It is hoped that this research has made a contribution to the following areas:

- Although earlier studies have examined citizens' adoption of e-government, there is little consideration of cultural influences upon citizens' adoption of e-government. This research has addressed this fundamental omission by investigating the effect of Saudi culture upon citizens' adoption of e-government, as well as proposing a conceptual model that embraces salient constructs.
- This research is built upon a conceptual model that is based upon a strong theoretical background, whilst adding new constructs that may influence e-government acceptance by citizens. It is based upon UTAUT, incorporating additional constructs to the proposed model that is based upon earlier literature. Trust of the Internet, trust of government, awareness of the system, compatibility, system quality and information quality factors have been incorporated in the model to assist in a better understanding of the phenomena.
- This study examined the interaction of demographic variables with the anticipated independent factors towards the dependent variable, the adoption of e-government, which is the case of the original UTAUT. Earlier literature considers demographic variables as independent factors and directly examined the correlation between the dependent variable and the demographic variables.



- A systematic literature review has been followed in this study to examine e-government within government, technology and management fields. An online survey method was designed in this study to survey a larger heterogeneous sample of the population, in order to overcome the problem of a conservative society within a wide area. In addition, this study has considered a broader application of e-government by not restricting the research to a single application. In contrast, previous studies have restricted their studies to only one department, such as the payment of taxes.
- Research findings confirm that the size of the youth population within Saudi Arabia does not play a role in determining citizens' acceptance of e-government. Although there is an insignificant correlation between the factors of social influences, compatibility and effort expectancy with the adoption, there are indirect significant relationships between these variables when they are moderated by demographic variables. Despite the importance of system awareness before adoption, awareness needs other supported factors to determine the adoption. Awareness alone does not predict the acceptance or the adoption of the system, and this is an important message for government. Government agencies and the mass media play a more important role in raising awareness of the system than through the processes of social interaction and use of the Internet.

## **Practice Implications**

The willingness of citizens to accept and adopt the new innovation will determine the success of the implementation of e-government. In order to create positive attitudes towards e-government, it is suggested that the Saudi government gives greater attention to the socio-cultural values that moderate the influence the adoption of e-government. The culture of Saudi society is religious in nature, with Islam playing a key role in determining the social norms, obligations, traditions, pattern, privilege and practice of the community. Islam is not solely a religious ideology, but a comprehensive system that encompasses all aspects of life (AlSaggaf, 2004). Cultural and technology adoption literature suggests that citizens or the culture of low level of adoption is not to be blamed, but that the technology should be tailored to suit the culture of citizens in order to encourage high acceptance of the new technology. This study suggests that policy makers and practitioners consider the culture of the society as the preliminary step of implementation, because cultural values strongly moderate citizens' behaviour towards the adoption of technology. The study findings confirm the influence of the cultural values as follows:

- Saudi society's conservative nature reflects itself in gender segregation and female dependence upon male's relatives in their government transactions, and is represented by the low number of females who participated in the survey, as well as their low level of awareness of e-government. Despite this, females showed greater interest in accepting and using the e-government services, which suggests that additional ways of raising system awareness for females should be considered by promoting the existence and benefits of the e-government programme on mass media channels, such as TV, radio and newspapers, as well as in schools and universities. Research findings confirmed that participants considered mass media and government agencies as the most significant channels in spreading system awareness. Collectivism characteristics and the tribal systems of society, as well as the manner that interpersonal communications influence citizens' behaviour should be considered by policymakers. It is suggested that the government should establish campaigns where important and influential people in society are asked to spread an awareness of the system and to encourage its use. It is essential that an emphasis is placed upon the compatibility of the innovation with citizens' religion, lifestyle and traditions, as well as other cultural values.
- Performance expectancy significantly influences the adoption of e-government and is a reliable predictor of users' intention to use the system. Thus, it is expected that the more benefits (saving time and money), the greater e-government adoption will be obtained. Moreover, this result could be explained by the lack of sense of time as a cultural value as the participants scored high for the flexibility and the accessibility of the system. This could explain the result, as people require more convenient and accessible services from anywhere and at any time when compared to traditional services. Practitioners and policy makers should consider promoting the benefits of the e-government programme to consumers and provide additional benefits to encourage wider promotion and acceptance of the system. Citizens should gain full benefits of the programme by avoiding the need for physical contact with government departments and this could be achieved when the government reached the advance level of the implementation process such as the transaction and integration stages. Carter and Weerakkody (2008) claim that the dissemination of an e-government programme will be increased when the government provides additional benefits to encourage users.

An additional explanation for the significant effect upon performance expectancy on the intention to use e-government is the high power distance cultural value of the society. Al-Gahtani et al. (2007) refer to cultures characterised by a high power distance dimension, whereby individuals are more likely to show deference to authority and conform to the expectations of those in important or superior roles. The government could exploit this cultural value by rewarding the potential and regular adopter of e-government services with rewards, including a reduction in government services fees or waiving violations.

- Although there is an insignificant correlation between e-government usage behaviour and the quality of the service at the current static implementation stage, the developers of the system should provide accurate, clear, complete and current information to citizens, in order to maintain consumer satisfaction and create positive attitudes to the system. The quality of service will gain greater importance at the advanced interaction stage when people require reliable, integrated and customer support services in order to carry out online transactions (Shareef et al., 2011).
- Research findings suggest that trust of the Internet is the second strong predictor of intention to use e-government services, which was predictable given that the society has a high uncertainty avoidance cultural value. Policy makers should implement advanced security standards in order to maintain a positive relationship with citizens, including use of digital signatures and third party guarantees. “Agencies should also use pamphlets and posters at their brick-and-mortar locations to emphasize the security and privacy mechanisms employed to ensure reliable services” (Be’langer and Carter, 2008; p.11).
- Availability of resources and computer self-efficacy are found to be significant predictors of usage behaviour, which is confirmed in the research. This study agrees with previous research that the digital divide, which includes the lack of IT skills among citizens and government employees, together with the lack of the required infrastructure are considered as the main barriers that prevent the successful implementation of e-government in Saudi Arabia (Al-Shehry et al., 2006; Gartner, 2007). Well-coordinated efforts are required from policy makers and implementers in order to bridge the gap of the digital divide in the country which is also reflected in the high power distance cultural value.

Despite the country's young and educated population having a greater ability to learn new technology, the wider country is hindered by the lack of provision of the Internet network and computer skills to rural areas in all parts of the county. The digital divide should be considered as a vital barrier that prevents the successful adoption of the scheme, not only among citizens, but also among government employees. Government leaders should increase funding in order to bridge the digital divide by improving computer literacy and building an effective infrastructure, and especially in the rural parts of the country.

## **Research Implications**

Implications for theory have been revealed from the findings of this study, as this has involved the validation and amendment of a framework that was based on UTAUT to identify critical factors that could influence the adoption of e-government in Saudi Arabia by its citizens. Therefore, additional variables have been included in this study, such as level of education, compatibility, awareness, quality and trust, but the voluntariness of use moderated variable was removed. A differentiation was adopted for this study between trust of government and trust of the Internet, as well as differentiating between information quality and system quality. The findings have revealed that the adapted model to investigate user behaviour and user intention of e-government was appropriate. Variance in behaviour of citizens to adopt e-government services has shown a total model validation that accounts for 60%.

Therefore, the final research question relating to enhancing adoption of e-government by citizens of Saudi Arabia by redesigning e-government implication has been answered, so future research into adoption of e-government by citizens to reveal determining factors, particularly for Arab countries where cultural values are similar, this enhanced model used for this study could be valuable.

In addition, the findings of this study into factors relating to adoption of e-government that are influenced by cultural values of developing countries have attempted to fill the gap in knowledge exposed by the review of literature on the subject. Another valuable contribution of this study has been a focus on critical influencing factors from the viewpoint of citizens relating to e-government adoption by evaluating socio-cultural values in the society.

Therefore, the research findings have been justified and the research hypotheses developed for this study by investigating these socio-cultural values. This study has also revealed that the critical factors relating to e-government adoption are not moderated by age, which contrasts to findings in previous studies. However, adoption of e-government has been shown to be significantly moderated by the variable of level of education, and the findings have validated previous research that the correlation of the critical factors affecting e-government adoption are moderated by Internet experience and gender.

Socio-cultural values identified by the findings of this study include youth population, high power distance, collectivism, uncertainty avoidance, sense of time and gender segregation. The study affirmed the critical role of the awareness at the early stage of the implementation through the mass media and via the interpersonal channels at the advance level. These findings have also revealed that for e-government adoption in Saudi Arabia, one significant obstacle is the problem of the digital divide, but predictors of citizens' adoption were shown to be trust of the Internet and performance expectancy. These findings have also indicated that effort expectancy, social influence and compatibility factors have an indirect influence on e-government adoption across moderated demographic or performance expectancy variables. However, trust of government and service quality were not shown to be variables that could predict e-government adoption by citizens, which contradicts the findings of previous studies and the prediction of this research.

## **Limitations of Research**

This study has evaluated adoption of e-government services in Saudi Arabia by attempting to provide a better understanding of influencing factors, which were based on a large heterogeneous sample and a well-established theory, but the researcher identifies some limitations for these findings like any other research studies. One limitation of this in-depth study of how socio-cultural values could moderate factors for adoption of e-government services by citizens has been the use of the survey strategy and quantitative approach, because this has restricted the detail when evaluating the variables.

Another limitation of this study relates to the sample population that were mainly young people, well educated and Internet users, as the intention had been to overcome the challenges of lack of private postal address services, coverage of a wide area and gender segregation to include a heterogeneous sample group. Therefore, by adopting an online survey, the sample population was limited to existing Internet users, who could have been influenced by factors that would be different for citizens that do not use the Internet. Some Saudi citizens were excluded from this survey if they could not afford the costs of the Internet or who would live in a rural area that had no Internet coverage. The sample population also showed a dominance of young people, well educated and male, which would be a reasonable expectation based on the general society of Saudi Arabia, which is described as young, educated and conservative.

A cross-sectional survey was adopted for this study to reveal what factors could influence adoption of e-government from the perspective of citizens, which could present an overview of a specific phenomenon within a relatively short period of time. However, this could be identified as a limitation, because longitudinal studies would be better for evaluating and observing change in a changeable environment, and researchers would have better control studying the variables for future research studies.

The findings from this study cannot be generalised to a wider sample group, such as all Internet users in Saudi Arabia influenced by its culture; however, future research studies into Gulf and Arab countries in the region that share socio-cultural values could apply the conceptual model to these countries to confirm the findings from this research study.

## **Future Research**

The scope of this study needs to be widened to further expand understanding and knowledge about e-government, because this is a phenomenon that is relatively new. Further research pathways that could be investigated and explored that relate to the theme of this research study could include the following areas:

- Factors influencing e-government adoption were investigated with a statistics quantitative approach for the current study to gain a better understanding of citizens' perceptions, but future studies could widen understanding and knowledge further by adopting the qualitative approach to learn more about perceptions and attitudes influenced by socio-cultural factors.
- The processes of e-government in Saudi Arabia have exposed political, organisational and technical factors from the review of literature that influence the stages of implementation in this current study, but future research could analyse these influencing factors in depth by adopting an empirical research approach.
- The conceptual model adopted for this current research could be used in future research studies with a larger sample population in Saudi Arabia, which could include citizens living in rural areas and non-Internet users.
- Future research studies into e-government adoption in other Gulf and Arab countries in the region that share cultural values that are similar to Saudi Arabia could adopt the conceptual model used in this current study to revalidate these findings.
- Other moderating factors have been highlighted from the review of the literature, such as cost and image, which could be used to expand the model adopted for this study to analyse their influence on e-government adoption.
- Future research studies into this subject could evaluate the factors that could influence business users in the adoption of e-government (G2B), which would provide valuable comparative study findings with this current study that has adopted a focus on citizens (G2C).
- Research findings would be stronger and more robust if future studies adopted a longitudinal study to investigate socio-cultural values, as these factors are relatively variable. In addition, future studies could analyse additional influencing factors of e-government adoption by citizens that are affected by socio-cultural values.

## **Conclusion**

This study has used the UTAUT theory to develop a conceptual model to identify relevant variables in the adoption of e-government in Saudi Arabia from the perspective of its citizens, but with a specific objective of evaluating behavioural factors influenced by cultural values. These findings on the adoption and implementation of e-government services have confirmed the critical factors identified in previous studies on this subject from the review of the literature.

This study has attempted to fill the gap in knowledge for e-government implementation by adopting a large sample population to survey citizens' adoption of these services from the demand side of this implementation within Saudi Arabia. These findings have indicated that insufficient consideration had been given to socio-cultural values of the country before implementing e-government services, which have significant moderating influences on adoption of new technology. This research has responded to this gap in knowledge by focusing on Saudi socio-cultural values, so that influencing factors could be exposed that should determine the behaviour of citizens towards the adoption of e-government services.



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## Appendix

### Questionnaire Survey

Dear Sir/Madam

I am a Saudi PHD student at the University of Birmingham, UK. I am conducting a survey on the factors affect citizen adoption of e-government in Saudi Arabia. The main objective of the research is to determine the factors affecting the adoption of e-government from citizens prospective by investigating the reasons behind the preferences of contacting the government agencies using traditional ways (face to face) and avoiding online transactions. This new innovation needs to tailor to the citizen's choice and needs by taking into account the religious, cultural, traditional and other beliefs variables in order to assure the dissemination and widespread adoption of the innovation.

I would be grateful if you could help me to a chive this goal by completing this survey. Please note that this research is purely for academic purposes. Your responses are also anonymous and confidential as no information that identifies you is asked in this questionnaire. I would like to let you know that your participation in this survey is completely voluntary and you are free to withdraw your participation from this study at any time befor you complete the survey but you cannot withdraw once you have completed the survey. Please follow the instruction provided before each question for answering the survey. This questionnaire takes less than 10 minutes to complete!

Mohammed AL-Saif

For any comments or concerns or to oder the study result please don't hesitate to contact me at

[REDACTED]

Or contacat my supervisor Dr Philip Whiteman at [REDACTED]

If you agree to participate in this survey Please tick the following box ☐

E-government Definition

" A new innovation which seek to transfer the traditional way of conducting government transactions into online services for better quality, cheap and fast services to the citizens".

Examples of e-government

- Looking for required documents in the internet.
- Printing official forms through the internet.

## Part 1: Personal Profile

Please check the box that gives the best answer for you.

### A) Gender

☐ Male

☐ Female

### B) Age

☐ Under 18,

☐ 18 to 25

☐ 26 to 35

☐ 36 to 50

☐ Over 50

### C) Education Level

☐ Pre secondary

☐ Secondary

☐ University

☐ Postgraduate

Others, please specify it .....

### D) Internet experience

How often do you use the internet?

☐1 Once a month or less

☐2 A few times a month

☐3 Once a week

☐4 Every day or two

☐5 Several times a day

My total years of internet usage are

<1 year

1-3 years

3-5 years

5-10 years

>10 years

☐1

☐2

☐3

☐4

☐5



## Part 2: E-government adoption

Please choose the appropriate answer.

1) Have you ever heard of the e-government concept before?

☐ NO

☐ YES

**If your answer is NO please go to part 5**

2) I am aware of the e-government services which provided by the Saudi government.

☐ Strongly disagree   ☐ Disagree   ☐ Neutral   ☐ Agree   ☐ Strongly agree

3) How important have the following been in learning about Saudi e-government?

Factors affect e-government awareness.	Very unimportant	Not important	Neutral	Important	Very important
Interpersonal communication (friends and families).					
Social media channel.					
Government agencies					
Browsing the web .					

4) Using e-government services is a good idea.

☐ Strongly disagree   ☐ Disagree   ☐ Neutral   ☐ Agree   ☐ Strongly agree

5) I like to use e-government website.

☐ Strongly disagree   ☐ Disagree   ☐ Neutral   ☐ Agree   ☐ Strongly agree

6) I plan to use e-government services in the future.

☐ Strongly disagree   ☐ disagree   ☐ neutral   ☐ agree   ☐ strongly agree

7) E-government services are something that I could do in the future.

☐ Strongly disagree   ☐ Disagree   ☐ Neutral   ☐ Agree   ☐ Strongly agree

8) Have you ever used e-government services before?

☐ NO   ☐ YES

**If your answer is NO please go to part 4**

### **Part 3:**

Please read each statement carefully, and check (✓) the response that best expresses your opinion about factors affect e-government adoption ( use behaviour) as explained in the following statements. Please, if you do not know you should check "neutral".

**Strongly disagree:** if you strongly disagree with the statement in the table.

**Disagree:** if you disagree with the statement in the table.

**Neutral:** if you don't agree or disagree about that the statement.

**Agree:** if you agree with the statement.

**Strongly agree:** if you strongly agree with the statement.

<b>Factors affect e-government adoption.</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly disagree</b>
I have the skill to use e-Government websites.					
I am confident about using e-Government websites.					
I think government agencies have the resources to perform dependable and reliable online services.					
I think that the government website has adequate security features.					
Information provided at the government website is up-to-date.					
Information provided at the government website is accurate.					
Information provided at the government website is complete data.					
The government website provides					

all relevant information necessary to fulfil my needs.					
The system is always suffering from shutdown problem.					
Online customer service is available at all times.					
The system provides continuous access to other resources.					
The system provides Integrated services.					

#### Part 4:

Please read each statement carefully, and check (✓) the response that best expresses your opinion about factors affect e-government intention to use behavior as explained in the following statements. Please, if you do not know you should check "neutral".

**Strongly disagree:** if you strongly disagree with the statement in the table.

**Disagree:** if you disagree with the statement in the table.

**Neutral:** if you don't agree or disagree about that the statement.

**Agree:** if you agree with the statement.

**Strongly agree:** if you strongly agree with the statement.

Factors affect e-government adoption.	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I think accessing E-government system 24/7 is an important feature for me.					
I think accessing E-government system from anywhere is an important feature for me.					
I think Using e-government save me time (you don't have to queue)					
I think Using e-government save me the cost (you don't have to travel to the government agency)					
Learning to interact with the website would be easy for me.					
I would find the website flexible to interact with.					

It would be easy to navigate the website.					
Interactions with the website would be clear and understandable for me.					
I think E-government is appropriate for my needs.					
I think E-government offers the chance for women to enroll with government services online.					
I think the e - government system is compatible with my religious aspects and cultural value.					
Using the website would fit into my lifestyle.					
People who influence my behaviour think that I should use e-government system.					
I would use online government services if important people to me used them					
People around me who use the e-government system have more prestige.					
I would use online government services if I needed to.					

## Part 5:

Please read each statement carefully, and check (√) the response that best expresses your opinion about factors affect e-government awarnesss as explained in the following statements. Please, if you do not know you should check "neutral".

**Strongly disagree:** if you strongly disagree with the statement in the table.

**Disagree:** if you disagree with the statement in the table.

**Neutral:** if you don't agree or disagree about that the statement.

**Agree:** if you agree with the statement.

**Strongly agree:** if you strongly agree with the statement.

<b>Factors affect e-government awareness.</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly disagree</b>
I belief that the internet is a dependable medium.					
I belief that the internet is a safe place to perform secure transactions					
I would hesitate to provide personal or financial information to the website.					
In my opinion Government agencies are trustworthy					
I belief of the capability of the agencies to perform online transactions faithfully.					
I belief of the ability of the staff to implement online services in a private manner.					
I have the skill to use computer technology					
I am confident about using computer technology					
I can afford computer hardware (PC)					
I have adequate computer technology at home.					
I can afford an internet connection.					
I always have access to a high-speed internet connection at home.					

If you have any comment or further factor which you think affect e-government adoption please specify

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THANKS FOR YOUR TIME